FINAL
Comprehensive Remedial Investigation Report

FORMER BLUE BEACH DISPOSAL AREA FUDS

North Kingstown, Rhode Island

Formerly Used Defense Sites (FUDS)
Property and Project Number D01RI0488 01

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APPENDIX

A Draft Final Human Health and Ecological Risk Assessment Report

LIST OF ACRONYMS

ADR	Automated Data Review
ASTM	American Society for Testing Materials
avgas	Aviation Gasoline
AVS	Acid Volatile Sulfides
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylene, Xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
CRMC	Coastal Resource Management Counsel
CSM	Conceptual Site Model
CTE	Central Tendency Exposure
CVOC(s)	Chlorinated Volatile Organic Compound(s)
CY	Cubic Yard
DCE	Dichloroethene
DERP	Defense Environmental Restoration Program
DNAPL	Dense Non-Aqueous Phase Liquids
DoD	Department of Defense
EDC	Economic Development Corporation
ELCR	Excess Lifetime Cancer Risk
ELUR	Environmental Land Use Restrictions
EM	Engineering Manual
EM-31	Electromagnetics-31
EOD	Explosive Ordnance Disposal
ER	Engineering Regulation
EP	Engineering Pamphlet
ERA	Ecological Risk Assessment
ERM	Environmental Resource Map
ESI	Environmental Sensitivity Index
ESV	Ecological Screening Value
FID	Flame Ionization Detector
FOD	Frequency of Detection
FS	Feasibility Study
FUDS	Formerly Used Defense Sites
GC	Gas Chromatograph
GPR	Ground Penetrating Radar
GSA	General Services Administration
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
HTRW	Hazardous, Toxic, and Radioactive Waste

LIST OF ACRONYMS (CONT.)

IDW	Investigation Derived Waste
ILOC	Interim Letter of Compliance
ISM	Incremental Sampling Methodology
LNAPL	Light Non-Aqueous Phase Liquids
LOAEL	Lowest Observed Adverse Effect Level
µg/L	Micrograms per liter
µg/kg	Micrograms per kilogram
µg/m3	Micrograms per Cubic Meter of Air
MCL	Maximum Contaminant Level
MEK	Methyl Ethyl Ketone/2-Butanone
mg/kg	Milligrams per kilogram
MSL	Mean Sea Level
MTBE	Methyl Tert-Butyl Ether
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAEL	No Observed Adverse Effect Level
NRCS	Natural Resources Conservation Service
OC	Organic Carbon
OSWER	Office of Solid Waste and Emergency Response
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
PID	Photoionization Detector
ppmv	Parts Per Million by Volume
QA/QC	Quality Assurance/Quality Control
QDC	Quonset Development Corporation
RCRA	Resource conservation and Recovery Act
RI	Remedial Investigation
RIEDC	Rhode Island Economic Development Corporation
RICC	Rhode Island Commerce Corporation
RIDEM	Rhode Island Department of Environmental Management
RIPA	Rhode Island Port Authority
RME	Reasonable Maximum Exposure
RQD	Rock Quality Designations
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SEM	Simultaneously Extracted Metals
SI	Site Investigation
SLERA	Screening-Level Ecological Risk Assessment

LIST OF ACRONYMS (CONT.)

SMP	Soil Management Plan
SSDS	Subslab Depressurization System
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCA	Trichloroethane
TCL	Target Compound List
TCE	Trichloroethene
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
UU/UE	Unlimited Use/Unrestricted Exposure
UCL	Upper Concentration Limit (RIDEM) / Upper Confidence Limit (Risk Assessment)
USACE	U.S. Army Corps of Engineers
USAGC	U.S. Army Geospatial Center
USC	U.S. Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VC	Vinyl Chloride
VOC	Volatile Organic Compounds

EXECUTIVE SUMMARY

This Comprehensive Remedial Investigation (RI) Report was prepared by Mabbett & Associates, Inc. (Mabbett) on behalf of the U.S. Army Corps of Engineers (USACE), New England District under Contract No. W912WJ-19-D-0005, Delivery Order No. W912WJ-23-F-0029. The Comprehensive RI was performed under the Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS) in accordance with the requirements of USACE Engineering Regulation (ER) 200-3-1, dated 10 May 2004. Consistent with ER 200-3-1, the RI and risk assessments were performed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Hazardous, Toxic, and Radioactive Waste (HTRW) risk assessments were performed in accordance with Engineering Pamphlet (EP) 200-1-15 for Standard Scopes of Work for Environmental Risk Assessments for the USACE.

The Former Blue Beach Disposal Area FUDS (Blue Beach Project) is located in North Kingstown, Rhode Island (Figure ES-1). The portion of FUDS property that was historically occupied by the Former Blue Beach Disposal Area is referred to in this report as the "Project" (Figure ES-2). The Site has since been redeveloped as part of a larger industrial park. Releases of chemical constituents to the environment from historical operations at the former Blue Beach Disposal Area were evaluated in this RI report. The nature and extent of constituents potentially originating from the Blue Beach Project include downgradient migration from the original source of release; the area impacted by site-related constituents is referred to in this RI as the "Site".

The Site encompasses an area approximately 21.5 acres in size and is comprised of the Former Blue Beach Disposal Area FUDS (Project Area) and the off-Project areas subsequently impacted by constituents migrating from the Project which include a walking path, tidal stream, Red Maple Swamp, and the Blue Beach recreational area (Figure ES-3).

Abutting the Site to the north and west, and immediately upgradient, is the Former Kiefer Park Tank Farm FUDS. In early investigations of this portion of the former Quonset Naval Air Station, the two sites were often investigated together, leading to the conclusion that the Former Kiefer Park Tank Farm FUDS is the primary source of petroleum-related constituents to the Blue Beach Project Area. Releases from the Former Kiefer Park Tank Farm appear to have impacted the western and northwestern portions of the Blue Beach Project and the adjacent Red Maple Swamp/tidal stream, whereas the Former Blue Beach Disposal Area (the subject of this RI) appears to be the primary source for metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and chlorinated volatile organic compounds (CVOCs) released to the environment in the Red Maple Swamp/tidal stream. Petroleum-related constituents at the Blue Beach FUDS are being addressed through a RI Interim Letter of Compliance (ILOC) under FUDS Property and Project NO. D01RI002912, and therefore are not included as part of this RI.

Remedial measures have been taken on both FUDS and based on most recent data, appear to have mitigated on-going releases such that residual contaminant levels in environmental media are relatively low and either steady or decreasing. Remedial measures on the Former Blue Beach Project have included the excavation of PCB-containing soils and the consolidation of soils under an asphalt cap or transportation and disposal of soils at an off-site facility (1998-1999 and 2001), removal of unexploded ordnance (UXO) scrap items and other debris during a 1998-1999 removal action, and removal and off-site disposal of debris during a 2011 test pitting investigation within an apparent CVOC source area. Removal actions taken in response to the release of petroleum hydrocarbons from the Former Kiefer Park Tank Farm, which have also improved environmental conditions at the Former Blue Beach Disposal Area, included installation of a product recovery trench and light-non-aqueous-phase liquid (LNAPL) recovery system to remove petroleum product to the north and west (upgradient) of the Blue Beach Project Area.

Data from RI sampling events completed in 2014 and 2019 were selected as most representative of current Site conditions following the completion of remedial actions and source removal on both FUDS. These data were used

to characterize the nature and extent of constituents in on- and off-Property media and were used to support the human health and ecological risk assessments for the Site (the risk assessment did make use of environmental sampling results collected before 2014 to provide additional data to inform certain exposure scenarios). Constituents from both FUDS were identified in off-Property media, including in surface soils, subsurface soils, hydric soils, sediments, pore water, and groundwater. The risk assessments considered local and regional background concentrations of PAHs and metals to distinguish between FUDS contamination and natural or anthropogenic background levels of these constituents.

Although concentrations of Project-related constituents were detected in environmental media throughout the on-Project and off-Project areas, the human health and ecological risk assessments concluded that, under current and reasonably foreseeable land use scenarios, constituents from the Property a) do not pose human health risks above USEPA target values for noncarcinogenic or carcinogenic risks and b) were not identified as posing ecological risk or warranting further evaluation for ecological risk under CERCLA.

No residential use of the Site is reasonably anticipated, and therefore none of the exposure scenarios evaluated will require remedial action to address actionable risk. Potential future use of groundwater from the Site is already restricted through an Environmental Land Use Restriction (ELUR) that was implemented as part of the groundwater remedy for the Former Kiefer Park Tank Farm FUDS. Furthermore, RIDEM has classified groundwater in the developable portions of the Site as GB, indicating the water may not be suitable for consumption without treatment due to known or presumed degradation.

The comprehensive RI performed by USACE between approximately 2011 and 2020 concluded that the human health and ecological risks from constituents on the Project are within or below the USEPA's target risk range, with the exception of the potential future use of on-Project groundwater (i.e., drinking water and showering/bathing) under a hypothetical future residential exposure scenario. This scenario is not currently reasonably anticipated as a future use of the Site and an ELUR has been implemented as part of the groundwater remedy for the Former Kiefer Park Tank Farm FUDS that prohibits the use of groundwater as a potable supply.

While the risk assessments concluded no unacceptable risks to current and foreseeable receptors at the Site, a screening evaluation was conducted to ensure the protectiveness of groundwater resources at the Site that are classified for potable use. Off-Project groundwater in Red Maple Swamp is classified by RIDEM as GA, indicating that this groundwater is a groundwater resource known or presumed to be suitable for public or private drinking water use without treatment. While there are currently no drinking water wells present in this area and no foreseeable future plans to add a drinking water well, the analytical results for groundwater samples collected from the GA groundwater area were compared to RIDEM GA groundwater criteria (comprised of USEPA MCLs and state-specific standards for MtBE and naphthalene). Given the groundwater criteria exceedances (trichloroethene, vinyl chloride, benzo[a]pyrene, naphthalene, and lead), there remains potential for impacts to groundwater. To address this potential for impacts, remedial alternatives will be developed and evaluated for off-Project groundwater.

1.0 INTRODUCTION

This Comprehensive Remedial Investigation (RI) has been prepared by Mabbett & Associates, Inc. (Mabbett) for the U.S. Army Corps of Engineers (USACE), New England District under Contract Number W912WJ-16-D-0004, Task Order Number 0002. The Comprehensive RI was performed under the Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS) in accordance with the requirements of Engineering Regulation (ER) 200-3-1, dated 10 May 2004.

The Former Blue Beach Disposal Area FUDS (Blue Beach Project) is located in North Kingstown, Washington County, Rhode Island. The FUDS identifying Property and Project number for the Blue Beach FUDS is D01RI0488 01 and the corresponding USACE New England District Project Number is 108369.

1.1 Regulatory Framework

The Department of Defense (DoD) has the responsibility to characterize and clean up former DoD facilities under the FUDS Program and the USACE is the lead agency responsible for environmental restoration of FUDS. The FUDS Program only covers properties transferred from DoD control prior to October 17, 1986. Investigations at the Blue Beach Disposal Area FUDS have been conducted under the FUDS Program since 1984.

The Comprehensive RI was conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act §120 (42 United States Code (USC) § 9620) (CERCLA or Superfund) as amended by the Superfund Amendments and Reauthorization Act (SARA) and the National Oil and Hazardous Substances Pollution Contingency Plan; National Contingency Plan (NCP) (U.S. Environmental Protection Agency [USEPA], 1990), and pursuant to USACE ER 200-3-1 FUDS Program Policy (USACE, 2004). This RI also considered and is consistent with the groundwater restoration policy goals stated in the USEPA Office of Solid Waste and Emergency Response (OSWER) Directive 9283.1-33 Summary of Key Existing USEPA CERCLA Policies for Groundwater Restoration (USEPA, 2009a).

Oversight by the State of Rhode Island (State) for the project is provided by the Rhode Island Department of Environmental Management (RIDEM) Division of Land Revitalization and Sustainable Materials Management. The RIDEM Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, dated April 2020 (“Remediation Regulations”), Rules and Regulations for Groundwater Quality (“Groundwater Regulations”), and other relevant RIDEM regulations were considered in the development of the RI approach (i.e., groundwater classification, background sampling protocol, discussion of risk drivers).

1.2 Project and Property Definition

The portion of FUDS property number D01RI0488 01 historically occupied by the Former Blue Beach Disposal Area is referred to in this report as the “Project”. A map of the Project vicinity is provided on Figure 1-1; the location of the Project within the Quonset Point portion of North Kingstown is provided on Figure 1-2. Releases of chemical constituents to the environment from historical operations at the former Blue Beach Disposal Area were evaluated in this RI report. The nature and extent of constituents potentially originating from the Project include downgradient migration; the area impacted by site-related constituents is referred to in this RI as the “Site”.

A map of the Site showing permanent structures and key ecological habitats within its boundary is provided on Figure 1-3. Also shown on Figure 1-3, the Former Kiefer Park Tank Farm FUDS (Project and Property Number D01RI0029 12) is not included as part of the Former Blue Beach FUDS. The petroleum constituents associated with releases from the Former Kiefer Park Tank Farm were addressed separately under the USACE Former Kiefer Park Tank Farm FUDS Project and are discussed in this RI only to provide context for constituents that are attributed to the Former Kiefer Park Tank Farm. Full details regarding the Former Kiefer Park Tank Farm FUDS Project history and investigations, nature and extent of contamination, and remedial actions are available in the Former Kiefer Park Tank Farm FUDS Project repository.

1.3 Purpose of Report

The objective of this Comprehensive RI is to determine the nature and extent of DoD-related contamination at the Site, to evaluate the fate and transport of that contamination, and to quantify potential human health and ecological risks associated with residual environmental contamination. This RI includes the results of historical investigations as well as recent investigations conducted by Mabbett since 2011. The recent investigations were conducted to address data gaps identified in the Conceptual Site Model (CSM) originally developed for the Site in 2011 (Watermark, 2011) and to provide additional environmental data to refine human health and ecological risk estimates.

Recent investigations were completed in two separate events in 2014-2015 and 2019-2020. In 2014-2015, Mabbett implemented a field investigation to achieve the following objectives:

- Characterize the nature and extent of chlorinated volatile organic compounds (CVOCs) in soil and groundwater in the eastern, southern, and western portions of the Site.
- Investigate a geophysical anomaly area for potential CVOC sources on the western side of the Hayward facility.
- Characterize the nature and extent of environmental contamination in pore water, sediment, surface water, hydric soil, and shallow soil at the Site resulting from historical operations at the Project.

After review of the 2014 environmental data and estimation of potential human health and environmental risks, Mabbett and USACE identified data gaps and uncertainties that prevented the development of representative exposure point concentrations for the risk assessment. Therefore, in 2019-2020 Mabbett implemented a supplemental field event designed to achieve the following objectives:

- Obtain a sufficient quantity of data to represent an average concentration in media with 95 percent confidence for certain site areas.
- Assess the extent of PCBs in soil in the western portion of the Site and in the central portion of the Site within the grassy shoulder of Hayward's parking lot on the western side of Whitecap Drive.
- Assess the extent of SVOCs in the immediate vicinity of the isolated southwestern portion of the Project.
- Further assess the concentrations of PCBs, SVOCs, and metals in surficial soil along the walking path.
- Further assess the concentrations of PCBs and metals in sediments located along the Blue Beach shoreline of Narragansett Bay.
- Further assess the concentrations of PCBs, SVOCs, and metals in sediments located in the Red Maple Swamp tidal stream.
- Further assess the concentrations of PCBs, SVOCs, and metals in hydric soil within Red Maple Swamp.
- Collect total organic carbon (TOC), grain size, toxicity testing, and macroinvertebrate samples from soil/sediment to support the ecological risk assessment.
- Collect background soil, hydric soil, and sediment samples in order to determine natural and anthropogenic background concentrations of key constituents so that they can be distinguished from FUDS-related contamination.
- Revise human health and ecological risk assessment estimates by evaluating historical and current analytical data collected at the Site.

The results of the 2011, 2014, 2015, and 2019-2020 field investigations are summarized in this Comprehensive RI Report. These data were used to perform baseline human health and ecological risk assessments, the results of which are described in this report and presented in detail in Appendix A.

1.4 Report Organization

The Comprehensive RI Report is organized in general accordance with the USEPA's "Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (USEPA, 1988). The ensuing sections of the report are organized as follows:

- Section 1 – Introduction
- Section 2 – Site Background
- Section 3 – Summary of Historical and Recent Site Investigations
- Section 4 – Physical Characteristics of the Site
- Section 5 – Nature and Extent of Contamination
- Section 6 – Contaminant Fate and Transport
- Section 7 – Baseline Risk Assessment
- Section 8 – Summary and Conclusions
- Section 9 – References

Tables and Figures are included in their own sections at the end of this report. The human health and ecological risk assessment prepared for this Site is included as Appendix A.

2.0 SITE BACKGROUND

In this section, the site history and current site description are provided. Land use, demographics, resource use, and other characteristics of the Site are described.

2.1 Site History

The Site is located in the southwestern portion of the Quonset Business Park (formerly the Quonset Point Naval Air Station [NAS]) in the Town of North Kingstown, Washington County, Rhode Island, approximately 20 miles south of Providence, Rhode Island. The Quonset Business Park is a State of Rhode Island asset that is managed by the Quonset Development Corporation (QDC), a development and management subsidiary of the RI Commerce Corporation (RICC). The Site is accessed by a paved road named Whitecap Drive, which is located off Circuit Drive (Figure 1-3).

The NAS was acquired in 1940 by the DoD for use as a training and support facility. Prior to construction of the NAS, the Site and surrounding area were used as farmland and residential land (at the time, a residential development to the west of the Site was called “Kiefer Park”), with a number of summer cottages located near the shoreline of Quonset Point (US Army Geospatial Center [USAGC], 2010). During construction of the NAS, these residential properties were apparently demolished, and extensive grading and filling occurred in the area, especially to the east of the Site, where streams and ponds draining to Narragansett Bay were filled.

The NAS was active during the World War II, Korean, and Vietnam conflicts. During operation of the NAS, the Blue Beach Disposal Area was used as a salvage yard for the storage and disposal of vehicle parts, machinery, construction debris, drummed materials, and miscellaneous wastes. However, no written records of the specific quantities of wastes are available for the Project. The wastes disposed of are presumed to have contributed to the constituents identified in various media on the Site.

In 1974, the NAS was deactivated and reported to General Services Administration (GSA) for disposal. GSA conveyed the site to the Rhode Island Port Authority (RIPA) and Economic Development Corporation (EDC) in November 1978 (GZA, September 1996). Following conveyance, the Quonset Business Park was developed and improved with light industrial manufacturing facilities and supporting infrastructure. In general, the current land use to the north and east of the Site is industrial/commercial; to the west of the Site are residential and commercial properties; and to the south is Narragansett Bay.

2.2 Site Description

The Site encompasses an area approximately 21.5 acres in size and is comprised of the Former Blue Beach Disposal Area FUDS (Project Area) and the off-Project areas subsequently impacted by constituents migrating from the Project which include a walking path, tidal stream, Red Maple Swamp, and Blue Beach. These areas are depicted on the Site map provided on Figure 1-3 and described in detail in the following sections. As previously noted, the Site does not include the Former Kiefer Park Tank Farm FUDS Project.

2.2.1 Former Blue Beach Disposal Area FUDS Project (On-Project)

The Former Blue Beach Disposal Area FUDS Project occupies approximately 13.4 acres of the Site. The Project boundary overlaps five real parcels, as depicted on Figure 2-1 and in the following summary matrix. The Project is alternatively described as “on-Project” in the risk assessment discussion.

North Kingstown Tax Assessor ID	Address	Owner	Features/Total Acreage	Name used in RI Report
Lot 179-025	Circuit Drive	Goldline Properties, LLC	Vacant, parking lot; 4.77 acres	Blue Beach FUDS Project

North Kingstown Tax Assessor ID	Address	Owner	Features/Total Acreage	Name used in RI Report
Lot 179-028	61 Whitecap Drive	Goldline Properties, LLC	Light manufacturing, offices, parking lot; 7.71 acres	Blue Beach FUDS Project
Lot 185-008	50 Whitecap Drive	Vantage Point Properties, LLC	Roadway southeast from Whitecap Drive, offices, parking lot; 2.64 acres	Blue Beach FUDS Project
Lot 185-020	66 Whitecap Drive	Falvey Realty, LLC	Offices, parking lot; PCB-cap area; 3.85 acres	Blue Beach FUDS Project
Lot 185-021	40 Whitecap Drive	Vantage Point Properties, LLC	Offices, parking lot; 3.4 acres	Blue Beach FUDS Project

2.2.1.1 61 Whitecap Drive

Hayward Industries, Inc. (Hayward), under Goldline Properties, LLC, owns and operates a pool products manufacturing and warehouse facility at 61 Whitecap Drive, occupying much of the western portion of the Project. The Hayward facility extends across two parcels (Lot 179-25 and Lot 179-28). The area to the east of the Hayward facility is improved with an asphalt parking lot for workers and delivery trucks. The remaining grounds around the Hayward facility are landscaped with grass and native vegetation.

The northern portion of the Project at 61 Whitecap Drive is adjacent to the Former Kiefer Park Tank Farm FUDS Project, which is located on portions of Lot 179-025 and Lot 179-028.

A seawall constructed with concrete and large boulders is located along the southern boundary of 61 Whitecap Drive. Construction design documents for the seawall were not available for the RI.

2.2.1.2 66 Whitecap Drive

Falvey Realty, LLC owns and operates an office building and parking lot at 66 Whitecap Drive. This parcel occupies the southeast portion of the Project that borders Narragansett Bay. The seawall along the southern boundary of 61 Whitecap Drive also extends along the shoreline at 66 Whitecap Drive.

The USACE-managed asphalt cap covering polychlorinated biphenyl (PCB)-contaminated soils is located at the southern end of Whitecap Drive, midway between the Hayward and Falvey facilities. Details of the PCB remedial action and constructed cap are summarized in Section 3.0.

2.2.1.3 40 and 50 Whitecap Drive

The Project also extends over small portions of 40 and 50 Whitecap Drive, both of which are owned by Vantage Point Properties, LLC. Vantage Point Properties LLC, leases the buildings for general office use by various tenants, including DuPont Water Technology, Clarke Valve, and AmWINS Group Benefits, Inc.

2.2.2 Walking Path and Blue Beach Recreational Beachfront (Off-Project)

Immediately west of the Project is the Walking Path/Blue Beach Recreational Beachfront parcel, which is owned by RICC. As its name implies, the parcel includes a public walking path that provides access to the Blue Beach recreational beachfront. The path was constructed and is maintained by QDC. The path is approximately 8-feet wide and covered with pea-stone and has an approximately 8-foot wide grass-covered shoulder on either side. The path begins at an asphalt-paved public parking lot to the south of Circuit Drive and extends south for

approximately 1,200 feet until reaching its terminus at the Blue Beach recreational beachfront along Narragansett Bay. The size of this parcel is approximately 1.50 acres.

North Kingstown Tax Assessor ID	Address	Owner	Features	Name used in RI Report
Lot 179-022	Listed as 0 Whitecap Drive (accessible from Circuit Drive)	RICC	Walking path Public beach	Off-Project Walking Path Off-Project Beachfront

2.2.3 Red Maple Swamp (Off-Project)

The western portion of the Site contains a coastal zone estuarine emergent wetland and scrub-deciduous forest (commonly referred to as "Red Maple Swamp"), which is owned by RICC. Red Maple Swamp is tidally-influenced via the Red Maple Swamp tidal stream, connected to the south to Narragansett Bay. The size of this parcel is approximately 7.74 acres.

North Kingstown Tax Assessor ID	Address	Owner	Features	Name used in RI Report
Lot 179-024	Listed as 0 Circuit Drive	RICC	Wetland with a tidally-influenced stream	Off-Project Red Maple Swamp

2.3 Demographics

The Site is located within the Town of North Kingstown, which is in southeast Rhode Island along the western shore of Narragansett Bay. North Kingstown is located in Washington County, which is comprised of several villages, of which Wickford is the largest. The other villages that comprise the Town of North Kingstown are Allentown, Belleville, Davisville, Hamilton, Lafayette, Saunderstown, and Slocum. North Kingstown covers a total area of approximately 43.5 square miles.

The area which is now North Kingstown was first settled in 1641 and was incorporated as Kings Towne in 1674, in honor of King Charles II. In 1722, Kingstown was divided into North Kingstown and South Kingstown. This area was a battleground for King Philip's War in 1675.

According to 2019 US Census data, North Kingstown has a population of 26,323 (US Census Quick Facts, 2020). The male population comprises 48.8 percent of the total population, whereas 51.2 percent of the population is female. Median household income is $89,874. According to 2019 US Census data, the four most highly represented races in North Kingstown are White (93.1%), Asian (1.5%), Hispanic (2.8%), and Black or African American (0.8%). Only 6.3 percent of the population speaks a language other than English at home. Accordingly, translation services do not appear to be necessary when circulating information regarding the Site.

2.4 Groundwater Resource Use and Classification

The RIDEM *Rules and Regulations for Groundwater Quality* (RIDEM, 2005) classify the State's groundwater into four classes (GAA, GA, GB, and GC) and establish groundwater quality standards for each class (RIDEM, 2009). The classifications provide a system for setting groundwater resource priorities in the State's regulatory and enforcement programs. Groundwater under the Site has two different RIDEM classifications: GA (off-Project to the west) and GB (on-Project and to the east), as depicted on Figure 2-2.

Groundwater classified by RIDEM as GB, including the water underlying the Site up to the border with Red Maple Swamp, indicates the groundwater may not be suitable for consumption without treatment due to known or presumed degradation. RIDEM states that GB groundwater shall not threaten public health or the environment;

adversely impact current or future uses of property, groundwater, or surface water; or violate any surface water quality standards or surrounding groundwater quality standards.

To the west of the Project (e.g., walking path, Blue Beach, Red Maple Swamp, tidal stream), RIDEM classifies groundwater as GA, indicating that this groundwater is a groundwater resource known or presumed to be suitable for public or private drinking water use without treatment. Likewise, RIDEM classifies groundwater as GA underlying the residential areas west of Red Maple Swamp. The Groundwater Quality Objectives for GA groundwater are generally equivalent to USEPA's Maximum Contaminant Levels (MCLs), plus state specific standards for naphthalene and methyl tert-butyl ether (MtBE), which do not have MCLs (RIDEM, 2009).

According to the RIDEM Groundwater Resource Map, the Site and areas within a 1-mile radius have no community or non-community wellhead protection areas, no sole source aquifers, no surface water protection areas, and no groundwater reservoirs or groundwater recharge zones (Figure 2-3).

Potable water is provided to the Site and throughout the Quonset Business Park by the RICC Water District; this water is obtained from three gravel-packed municipal groundwater wells developed in the Hunt Aquifer, and the wells are located approximately 3 miles upgradient from the Site. The residential neighborhoods located to the west of the Site are served by municipal water pumped from 11 gravel-packed wells distributed by North Kingstown Water District. There were no potable water supply wells identified within the Site boundary.

2.5 Environmental Land Use Restrictions

Environmental Land Use Restrictions (ELUR) that prohibit unrestricted residential activity and potable use of groundwater have been recorded on the deeds in the Town of North Kingstown Land Records for several of the parcels comprising the Site. These ELURs include Soil Management Plans (SMP) to control and limit the handling and exposure of potentially contaminated soil by workers. The parcels with existing ELUR/SMPs include:

- Plat 185, Lots 8 and 21 (50 and 40 Whitecap Drive); recorded April 11, 2005.
- Plat 179, Lots 28 and 29 (61 Whitecap Drive); recorded January 15, 2004 and April 28, 2008.
- Plat 179, Lots 25, 26 and 27 (61 Whitecap Drive); recorded January 31, 2007.
- Plat 185, Lot 20 (66 Whitecap Drive); recorded March 24, 2009.

Under the separate Former Kiefer Park Tank Farm FUDS Project, USACE submitted ELURs/SMPs for the parcel containing the Walking Path/Blue Beach beachfront (Lot 179-022), for the parcel containing Red Maple Swamp (Lot 179-024), and for the Circuit Drive Public Parking Lot (Lot 179-033). The ELURs prohibit unrestricted residential activity and potable groundwater use, and the SMPs are intended to control and limit the handling and exposure of contaminated soil by workers. RICC, as the owner of these parcels, recorded the ELUR/SMPs on the deeds with the North Kingstown Tax Assessor on April 16, 2018. Evidence of the recordings can be found in the North Kingstown Town Clerk's records in Book 3117 beginning on Page 1 (Lot 179-022), in Book 3116 beginning on Page 285 (Lot 179-24), and in Book 3116 beginning on Page 301 (Lot 179-33).

Although these existing ELURs prohibit residential use and potable groundwater use at these parcels, as a conservative measure the hypothetic future residential exposure scenario was evaluated in the human health risk assessment (Appendix A).

3.0 SUMMARY OF HISTORICAL AND RECENT SITE INVESTIGATIONS

Since 1984, USACE and others have conducted investigations to identify Project-related hazardous substances and potential sources of release to the environment. Findings from selected historical investigations performed prior to 2011 as well as more recent investigations conducted since 2011 at the Site are summarized in the following sections. Additional details about the recent investigations completed between 2011 and 2020 are available in the respective trip reports (Mabbett, 2012; Mabbett, 2016; Mabbett, 2020).

Because the Site is adjacent to the Former Kiefer Park Tank Farm FUDS Project, the scope and extent of many historical investigations have overlapped both FUDS Projects (Figure 1-3). Accordingly, the historical (pre-2011) investigations focused primarily on dissolved-phase petroleum and light non-aqueous phase liquid (LNAPL) constituents associated with the Former Kiefer Park Tank Farm FUDS Project as well as pesticides, PCBs, CVOCs, and metals. These historical investigations involved the collection of approximately 800 samples of groundwater, sediment, hydric soil, surface soil (0-2 ft bgs), subsurface soil (>2 ft bgs), surface water, and soil vapor. Additionally, bedrock cores were collected from five borings during these historical investigations (MW-19, MW-20, OW-1, OW-3, and OW-4; GZA, 1993; GZA, 1997).

During historical investigations, solid wastes such as wire cable, rubber tires, parts of jet engines, drums containing transformer oil, miscellaneous wood and metal, and training non-explosive ordnance were also found and subsequently removed from the Project and the Former Kiefer Park Tank Farm FUDS.

The historical investigations provided a substantial understanding of the physical characteristics and the nature and extent of contamination at the Site. In 2011, the historical data were used to develop a preliminary CSM and data gap evaluation (Watermark, 2011). This preliminary CSM served as the basis for the 2011 RI/FS Work Plan and the subsequent investigations conducted in 2011 through 2015. Additional data gaps identified after completion of the 2014-2015 investigations were resolved during the 2019-2020 portion of the RI.

The following is a timeline of the historical investigation and remedial activities reports conducted between 1984 and 2012:

- **1984**: Evaluation of drums of transformer oil and PCB contaminated surficial soils in the salvage yard (original source unknown).
- **1984**: Preliminary Assessment (PA) completed by NUS Corporation for USEPA Region I (NUS, 1984).
- **1988**: Quonset Point Confirmation Study by Sirrine Environmental Corp. (SEC, 1988).
- **1992**: Soil gas Survey of Blue Beach Disposal Site (GZA, 1992).
- **1993**: Engineering Evaluation of Contamination (GZA, 1993).
- **1994**: Supplemental Engineering Evaluation of Contamination (GZA, 1997).
- **1996**: Final Site Inspection Prioritization Report for Blue Beach (CDM Federal, 1996).
- **1997**: Delineation, Remediation, and Disposal of Buried Drums at Blue Beach Disposal Site (Weston, 1997).
- **1998**: Environmental Assessment and Finding of No Significant Impact for general environmental restoration work under DERP at the Quonset Point Naval Air Station (IEP, Inc., 1988).
- **1998-1999**: Blue Beach PCB Remediation and Debris Consolidation, Install PCB Cap (ECC, 1999).
- **2001**: Phase I and Phase II Site Assessment of Blue Beach Property (NE&C, 2001a).
- **2001**: Geotechnical Investigation for the Proposed Goldline Controls Building (NE&C, 2001b).
- **2001-2002**: Phase III Investigation and PCB Remediation Activities, (ECC, 2003).

- **2002**: CDW performed a limited investigation of the walking path to determine if residual petroleum hydrocarbons from the Kiefer Park FUDS Project were migrating at the beachfront (CDW, 2002, CDW, 2003).
- **2005-2009**: USACE performed groundwater sampling for VOCs at selected monitoring wells throughout the Site (USACE, 2009).
- **2009**: Geophysical Survey on the Blue Beach FUDS Project (Hager-Richter, 2009).
- **2010**: Examination of historical photography at the former Blue Beach disposal area and Kiefer Park Tank Farm (USAGC, 2010).
- **2006-2012:** Groundwater chemical analysis data (CVOCs and cadmium) collected from five wells at the Falvey Realty Property.

Summaries of the pertinent points and findings of these investigations, remedial activities, and how they focused subsequent investigations are provided in the following sections. Section 3.1 discusses historical studies and interim removal efforts and how they influenced the Site recognizing that many of the earlier work was done on both the Former Kiefer Park Tank Farm Site and on the Former Blue Beach Disposal Area Site (the subject of this RI). The most recent investigations were the basis for describing current Site conditions in this RI (Section 3.2) and were therefore the data used in the baseline risk assessments.

3.1 Historical Investigations and Remedial Measures

Historical investigations and remedial measures are discussed in this section to provide context for existing conditions. Section 3.2 below describes more recent investigations that are used to define current conditions on the Site. Investigations from 2014 and 2019 described in Section 3.2 were the basis for the baseline risk assessments discussed in Section 7.0.

3.1.1 Drum Removal & Soil Investigation, 1984

In 1984, the RIPA removed 16 to 18 drums, which reportedly had been left by the Navy, of transformer oil from the southeast corner of their salvage yard (Figure 3-1) (described in GZA, 1993). The oil in the drums was tested and reportedly did not contain PCBs. However, surficial soil samples were collected from six locations within the former drum storage area of the salvage yard and PCBs were detected in several of these samples. The summary report for this investigation is not available.

3.1.2 Contaminant Confirmation Study, 1988

Sirrine Environmental Consultants (SEC) completed a Contamination Confirmation Study in 1988 (SEC, 1988). As part of the evaluation, three test borings were advanced to depths between 21 to 26 feet below ground surface (Figure 3-2). Each of these soil borings were completed as monitoring wells (BMW-1 through BMW-3), which are located in the southern portion of the former Navy salvage yard along the former fence line. Groundwater samples were collected from these wells and analyzed for VOCs, metals, petroleum hydrocarbons, total organic carbon, organic halides, total phenols, pesticides/PCBs. Low levels of VOCs were identified in the groundwater samples. Metals were reportedly not detected at elevated levels.

Six surface soil samples and one background soil sample were also collected and analyzed for the presence of VOCs, total recoverable metals, total recoverable hydrocarbons (TRPHs), total organic carbon (TOC), total organic halides, total phenols, pesticides/PCBs and selected metals (BG-1 through BG-7). PCBs and metals were detected in these soil samples.

3.1.3 Soil Gas Survey at Blue Beach Disposal Site, 1992

As the initial phase of its Engineering Evaluation of Contamination at the Blue Beach Disposal Site, GZA completed a soil gas survey covering the Former Blue Beach Disposal Area (Figure 3-3) (GZA, 1992a). A similar soil gas survey was performed at the Former Kiefer Park FUDS Project at the same time (GZA, 1992b). Soil vapor samples were collected in a grid formation with grid nodes placed at 60-foot intervals. Based on reported groundwater depths of 7 to 13 feet, a soil gas sampling depth of 3.5 feet below surface grade was used for the survey.

A total of 119 points were sampled at the Former Blue Beach Disposal Area. Of these, 83 (70 percent) were found to contain detectable VOC soil gas concentrations of trace to 67 ppm. Of the 83 "detect" locations, 64 were identified as containing CVOCs, ten contained benzene, toluene, ethylene, and xylene (BTEX) compounds, and ten contained unknown compounds.

Forty-one (64 percent) of the samples containing CVOCs exhibited total CVOC concentrations of less than 0.1 ppm. Thirteen locations (20 percent) yielded aggregate concentrations of greater than 0.25 ppm, and only five (8 percent) had an aggregate CVOC concentration of greater than 1 ppm (ranging from 1.2 to 46 ppm). Identified CVOCs included trichloroethene (TCE); tetrachloroethene (PCE); 1,1,1-trichloroethane (TCA); 1,1-dichloroethene (DCE); and 1,2-DCE. The highest CVOC concentration at each location was generally TCE or PCE. The highest CVOC concentrations were detected in the southeastern and southwestern survey areas in the vicinity of the former Navy salvage yard.

Non-chlorinated VOCs, including BTEX, were identified at 10 locations in two main portions of the survey area. These compounds are the volatile constituents of lighter fraction fuels, including aviation and jet fuels. The highest concentrations (up to 67 ppm) were observed at soil gas locations in the north-central portion of the survey area adjacent to the Former Kiefer Park Tank Farm. The chromatograms for these samples indicated that the constituents might be from a volatile petroleum in the range of aviation fuel.

The second identified area of detected BTEX concentrations was in the south-central portion of the survey area. BTEX concentrations ranging from trace to 24 ppm were detected in seven samples collected from this area. Gas chromatograph (GC) analysis of these samples indicated that the VOCs in this area are primarily benzene or xylene compounds, which is consistent with the GC results from the northern VOC area described above. The characteristics of the chromatograms for samples from this area also suggest the presence of volatile petroleum in the range of aviation and jet fuels.

3.1.4 Engineering Evaluation of Contamination, 1993

In 1993, GZA completed the Engineering Evaluation of Contamination at the Blue Beach Disposal Site (GZA, 1993). The objective of this evaluation was to assess the lateral and vertical extent of constituents in soil and groundwater which may have been released from the operation of the disposal site, as well as at the adjacent, upgradient former underground jet fuel and aviation gas storage tank farm (Former Kiefer Park Tank Farm). The evaluation included a soil gas survey (Section 3.1.3), test pit excavation, advancement of soil borings and installation of groundwater monitoring wells, *in situ* permeability testing, and soil and groundwater sampling and analysis.

Twenty test pits were excavated to evaluate the horizontal and vertical extent of contamination in the unsaturated zone and to investigate for the presence of buried debris (Figure 3-4). With two exceptions, the excavation depth of each test pit was 6 feet. Test pit TP-6 was continued to a depth of 12 feet due to the discovery of buried debris (including three crushed drums) and TP-14 was excavated to a depth of 8 feet to investigate the depth of the fill at that location.

The drilling program consisted of a series of soil borings to further evaluate the horizontal and vertical extent of constituents at the site. A total of 16 soil borings were advanced (Figure 3-4). Eleven of the soil borings were converted to monitoring wells (OW-1 through OW-11). Seven of the wells were advanced to depths of 20 to 22

feet and screened across the water table (OW-2, OW-5, OW-6, OW-7, OW-9, OW-10, and OW-11). Three intermediate-depth (OW-1, B-1, and B-5) and one deep soil boring (B-8) were advanced on site. The depth of these borings ranged from approximately 33 to 65 feet below ground surface. Boring B-8 was completed as monitoring well OW-3, which was screened from depth of 12 to 22 feet. A separate boring was advanced next to boring B-5 and completed as monitoring well OW-8A, which was screened between 12 and 22 feet. The OW-1 boring was completed as monitoring well OW-1 with a screened interval from a depth of 6 to 16 feet. Hydraulic conductivity testing was conducted in each of the observation wells (OW series).

Based on photoionization detector (PID) screening, one soil sample, with the highest PID reading, from each boring was submitted for laboratory analysis. Groundwater sampling was performed at the eleven OW-series monitoring wells and three previously existing monitoring wells (BMW series). No NAPLs were observed during sampling of the monitoring wells.

Key findings of GZA's studies can be summarized as follows:

- The soil gas survey identified TCE, PCE, and BTEX compounds in soil gas within the former Navy salvage/material storage yard. There were two general areas of TCE and PCE detections, with higher concentrations in the southwestern portion of the salvage/material storage yard, and lower levels in the southeastern portion. BTEX compounds were detected in the south-central portion of the salvage/material storage yard.
- Constituents detected in soil and groundwater at the site included VOCs, SVOCs, petroleum hydrocarbons, pesticides, PCBs, and metals. The highest concentrations were detected in the area of the buried drums encountered in the southeastern portion of the former Navy salvage/material storage yard, where concentrations of petroleum, PCBs, and heavy metals were detected in soil and/or groundwater samples.
- The highest concentrations of CVOCs were detected in the groundwater sample collected from monitoring well OW-9, installed within the area of CVOCs identified by the soil gas survey.
- Pesticides and metals (mercury and cadmium) were detected in soil samples collected throughout the investigation area, with no identified source(s) other than general conditions associated with historical site usage. PCBs (Aroclor 1260) were also detected in soil samples from throughout the salvage/material storage yard and in shallow soils from the beach area, along the south fence line of the salvage/material storage yard. PCB concentrations were less than 1.0 ppm.
- The GZA study identified at least two additional potential onsite sources of contamination to groundwater: the buried drum area (TP-6) and the area of CVOCs in soil in the southwestern portion of the salvage/material storage yard (OW-9). These two areas were in addition to the former PCB/waste oil drum storage area located in the southeastern portion of the former Navy salvage/material storage yard, as described in Section 3.1.1 and depicted on Figure 3-1.
- GZA also identified two off-site potential sources to groundwater: the former General Dynamics salvage/material storage yard and the Former Kiefer Park Tank Farm, both of which are located hydraulically upgradient of the Site. Low-level petroleum hydrocarbons were detected in saturated soils in a boring in the northcentral portion of the former Navy salvage/material storage yard, which was suspected to have migrated from the Kiefer Park Tank Farm. Furthermore, CVOCs (TCE and PCE) detected in groundwater samples collected from the eastern portion of the Site were attributed to migration from the former General Dynamics salvage/material storage yard, which was part of the Blue Beach Disposal Site during its operation by the NAS. The location of the former General Dynamics salvage/material storage yard is shown on Figure 3-4.

3.1.5 Supplemental Engineering Evaluation of Contamination, Kiefer Park/Blue Beach, 1994

The objectives of the Supplemental Engineering Evaluation of Contamination (SEEC) were to further evaluate the presence of buried drums and/or debris at the site; perform additional field investigations and laboratory testing to provide supplementary information concerning the lateral and vertical extent of previously identified soil and groundwater contamination (GZA, 1997).

The SEEC was performed in 1994 and involved investigations in both the former Kiefer Park Tank Farm and the Blue Beach Disposal Area (Figures 3-5 and 3-6). Specific activities undertaken during the SEEC included the excavation of test pits, trench excavations, and soil borings, the installation and sampling of monitoring wells, soil and groundwater screening and analyses, *in situ* permeability testing, measurement of groundwater levels in wells, and site surveys.

A series of thirty-five test pits and approximately 200 linear feet of trenching were excavated to further investigate the presence and nature of buried debris within the former salvage yard. The test pits were designated TP94-1 through TP94-35. The trenching program was performed in the southeast portion of the former Navy salvage yard, in the area in which three crushed drums were previously encountered. Three main trenches were completed, along with five supplementary pits excavated to better define the lateral extent of the debris fill observed in the trenches.

The first trench, Trench-1, commenced northeast of former test pit TP-6, where crushed drums were encountered during the Engineering Evaluation (Section 3.1.4), and extended approximately 50 feet to the southwest. The exploration encountered miscellaneous fill, a mixture of soil and debris, to a depth of approximately 14 feet below grade. The debris included charred timbers, glass bottles, bricks, concrete, scrap metal (including gears, gauges, and pipes), an empty rubber fuel tank, and 25 steel drums. Of the 25 drums, approximately six were the remains of crushed drums, and 19 were relatively intact. Drums were removed from the excavation and temporarily stockpiled on polyethylene sheeting.

Trench-2 was excavated along the eastern fence of the former Navy salvage yard, extending to the north until natural soil was encountered at shallow depth approximately 70 feet south of the former General Dynamics salvage yard boundary. Trench-3 was excavated along the General Dynamics salvage yard boundary, extending to the west until natural soil was encountered approximately 74 feet west of the corner of the former Navy salvage yard. Only one empty drum was encountered (2 feet below ground surface) and removed from Trench-3.

After the completion of Trench-3, USACE decided not to continue drum excavation, but rather to complete the remainder of the 35 test pits and then expand the exploratory program to the General Dynamics portion of the site in an effort to characterize and delineate the area of drum fill. This decision was made recognizing that buried drums would likely remain in the ground following completion of the exploratory program. However, after encountering military ordnance at boring location B94-20, the determination was made to discontinue subsurface exploration work within the salvage yard portion of the site. Section 3.1.6 below describes additional drum removal conducted by Roy F. Weston in 1997.

A total of 16 surface soil samples, designated SS-1 through SS-16, were also collected from the former PCB storage area in the northeast corner of the former Navy salvage yard and from the waterfront/recreation area (Figure 3-5). No VOCs were detected in the soil samples collected from any of the test pits and soil borings. Aroclor-1260 was detected in eight surface soil samples collected from the Blue Beach Disposal Site. Three samples were reported with concentrations of PCBs above 20.0 mg/kg.

To evaluate groundwater quality in Red Maple Swamp, GZA installed 15 manually-driven wellpoints. The wellpoints were designated WP-1 through WP-15 (Figure 3-6). Each wellpoint consisted of a 3-foot long, 2-inch I.D., stainless steel well screen (0.020-inch slot size). Each well extended approximately 3-feet below ground surface.

Six surface water samples were also collected from the wetland, drainage swale, and former interceptor trench. Twelve sediment samples were collected from seven locations within Red Maple Swamp and the former interceptor trench. These samples were collected to evaluate whether petroleum and other site constituents had migrated to the wetland and impacted sediments, and to provide inputs to the human health and ecological risk assessments to evaluate potential risks from exposures to the wetlands. The sample locations were designated SED-1 through SED-7 (Figure 3-5). Except for SED-6 and SED-7, both shallow and deep sediment samples were collected from each sample location.

3.1.6 Remediation and Disposal of Buried Drums at Blue Beach Disposal Site, 1996

Roy F. Weston, Inc. (Weston) completed the drum removal project in the summer of 1996 (Weston, 1997). That project is described in Weston's January 31, 1997 draft project completion report entitled "Delineation, Remediation, and Disposal of Buried Drums at Blue Beach Disposal Site, North Kingstown, Rhode Island." According to that report, Weston transported and disposed of 18 drums, two 30-yard roll-off containers of residual materials associated with the drums, and 25 square feet of non-friable asbestos debris.

3.1.7 Blue Beach PCB Remediation and Debris Consolidation, 1998-1999

The objectives of the 1998-1999 remediation effort were to perform test pit excavations to define the limits of excavation required within Areas 1 and 2 (Figure 3-7); consolidate two debris areas into one consolidated pile; place gravel and a bituminous concrete cap over the debris pile; install a stone-lined toe; and remove, sample, and dispose of PCB/PAH contaminated soils from the Blue Beach FUDS Project (ECC, 1999).

A total of eleven test pits were excavated. Excavation, segregation, and removal of items from test pits was performed concurrently with removal activities at Area 1. Soil and debris from Area 1 were excavated and stockpiled. The stockpiled material was placed in either a reuse stockpile or a disposal stockpile. The material was screened using visual, olfactory, and headspace (flame ionization detector [FID] and PID) methods for total petroleum hydrocarbons (TPH). Soil that had a headspace reading of less than 10 parts per million by volume (ppmv) by PID and 100 ppmv by FID was stockpiled for reuse. The remaining soil was stockpiled to be placed in Area 2 and capped. A total of 1,800 cubic yards (CY) of soil was stockpiled and placed under the cap in Area 2.

During excavation activity in Area 1, 1,114 pieces of unexploded ordinance (UXO) scrap items were uncovered in the area referred to as the explosive ordinance disposal (EOD) pit. Ordnance related scrap was described as inert (USACE, 1999). Soils encountered on the floor of the excavation (10 to 12 ft bgs) displayed characteristics of petroleum contamination at a location approximately in the center of Area 1 and 50 feet south of the north edge of Area 1 and were attributed to the Former Kiefer Park Site and were left in place (USACE, 1999).

Soil excavated from Area 1 was placed, compacted, and capped in Area 2 on November 5, 1999. After the material from Area 1 was placed, compacted, and tested, a 12-inch layer of gravel sub-base was placed over the soil to ensure proper drainage. A 6-inch stone lined toe layer was installed on the west end of the Area 2 cap on top of the gravel sub-base. Stone was placed along the perimeter of the cap to ensure erosion control. A bituminous concrete pavement cap was placed over the subbase material. This work effort was labeled "Phase 2 PCB Remediation" and the PCB characterization results are termed Phase 2 delineation.

3.1.8 Phase I/II Environmental Site Assessment, 2001

In 2001, Northeast Engineers & Consultants (NEC) conducted an ASTM Phase I/II Environmental Assessment on Lots 179-28 and 179-29 (later combined into Lot 179-28) to identify the presence or likely presence of hazardous substances or petroleum (Figure 3-8) (NEC, 2001a). The Phase I Environmental Assessment focused on a document review, including past investigations of both the Former Blue Beach Disposal Area and the Former Kiefer Park Tank Farm, and site reconnaissance.

The Phase I Assessment identified the following concerns:

- Previous environmental investigations of the Kiefer Park Tank Farm identified a plume of LNAPL on the surface of the groundwater table that extended onto the northwestern portion of the Blue Beach Disposal Area Site. The extent of the plume required additional investigation.
- The potential impact to groundwater in the vicinity of the previously remediated Areas 1 and 2 required additional investigation.
- TCE was detected at a concentration of 1,100 µg/L, which was above the RIDEM GB Groundwater Objective of 540 µg/L, in a groundwater sample collected from monitoring well OW-9 in 1996.

To evaluate these data gaps, NEC completed a field investigation program consisting of the advancement of test borings and installation of monitoring wells, measuring relative groundwater elevations, and collecting and analyzing soil and groundwater samples. NEC advanced eight borings; four of the borings in the northeastern portion of the site were advanced to 20 feet and completed as groundwater monitoring wells (NEC-2, NEC-4, NEC-5, and NEC-6). These monitoring wells, along with wells installed during the 1994 Engineering Evaluation (W94-6, MW-12, MW-21/DB-14, MW-11, W94-15, and W94-16), were gauged and sampled (Figure 3-8). Measurable LNAPL thickness was not observed in any of the ten wells gauged; however, petroleum sheen was observed in six of the wells. The results of the laboratory analyses indicate that VOCs were not detected above the GB Groundwater Objective in any of the samples, although levels of TPH were reported.

One soil boring was also competed as groundwater monitoring well (NEC-1) on the northeastern portion of the Project downgradient from former debris Area 1. VOCs and SVOCs were not detected in soil samples collected from this boring. The groundwater sample collected from NEC-1 was reported with petroleum related compounds, but none were detected above RIDEM GB Groundwater Objectives. No LNAPL was detected, but a sheen was noted in NEC-1 during sampling. NEC concluded that the modest impacts observed in NEC-1 were not due to Area 1 but rather to the nearby Former Kiefer Park Tank Farm.

Boring NEC-3 was completed as a groundwater monitoring well in the northeastern portion of the Project, downgradient from former debris Area 2, which is the location where soil was consolidated during the Phase 2 PCB Remediation in 1998-1999. The groundwater sample collected from NEC-3 was reported with detected concentrations of VOCs. Analysis of groundwater samples from nearby monitoring wells BMW-2 and OW-11 were non-detect for VOCs. Based on these results, NEC concluded that groundwater had not been significantly impacted by the debris buried beneath the Area 2 cap.

Consistent with previous findings, the groundwater samples collected from OW-8 and OW-9 during the 2001 Phase II ESA were reported with concentrations of TCE and PCE.

Based on the findings of this investigation, NEC concluded that the groundwater beneath the northern portion of the Project had been impacted by petroleum contamination originating from the Former Kiefer Park Tank Farm. In addition, the groundwater in the vicinity of well OW-9 was impacted by CVOCs.

3.1.9 Geotechnical Investigation for the Proposed Goldline Controls Building, July 2001

NEC completed a geotechnical investigation to explore subsurface conditions below the proposed building site (the current Hayward facility) in order to develop recommendations for site preparation and foundation design (Figure 3-9) (NEC, 2001b). The field exploration program consisted of drilling and logging nine geotechnical borings ranging from 2 to 22 feet in depth. No evidence of a release was noted in any of these soil borings.

These borings provided the basis for a detailed description of subsurface materials beneath and surrounding the Hayward Building. The borings generally encountered sandy soils that become finer with more silt and denser with depth. The upper layer encountered in each boring (except B-9) is a well-graded sand that is likely to be previously placed fill from the original site development in the 1940s. Boring B-9 was drilled to the south of the former Quonset Hut location and may represent original surface soils consisting of fine sand. In the other borings,

fine sand was encountered beneath the well-graded sand, with increasing amounts of silt. The well-graded sand is generally medium dense in consistency, and the underlying fine sand is generally medium dense to very dense. There were a few areas of loose sand encountered in Borings B-7 and B-9 between layers of denser sands.

Three of the soil borings were advanced to refusal. The deepest boring (B-4) encountered very dense sand and silt with rock fragments below 25 feet that was interpreted to be glacial till. This boring met refusal at 32.3 feet, which may be bedrock or a boulder in the till. The shallower depths of refusal in the other two borings are believed to be due to boulders or very dense till.

3.1.10 Phase III Investigation and Remediation Activities, 2001-2002

A Phase III investigation was conducted in March 2001 (EEC, 2003). The purpose of this investigation was to delineate the extent of PCBs in soils beneath the paved access roads and additional areas identified during the Phase II sampling. Fifty-nine surface soil samples were collected. Samples were collected beneath the asphalt at 100-foot intervals along the centerline of the access roads and from the area south of the scale house at 50-foot intervals (Figure 3-10).

Based on recommendations in the Final PCB Letter Report (ECC, 2001), Phase III remediation activities were initiated in 2001. During October 2001, a total of 822 CY of PCB-containing material was excavated and disposed off-site. After excavation of the initial volumes, laboratory confirmation sampling indicated further remediation was necessary. A second excavation was conducted in November 2001 to complete the removal of soils with PCB concentrations above 10 mg/kg. A total of 1,660 CY of PCB-contaminated soils were removed and disposed during the two excavation events.

3.1.11 Limited Site Seepage Investigation, 2002

In 2002, an investigation was performed to evaluate the continuing observations of petroleum seepage along a section of beachfront downgradient from the disposal area (Figure 3-11) (CDW, 2002; CDW, 2003). The study area was established as an approximately 750 foot long by 30-foot wide pathway, from a former interceptor trench adjacent to the former Kiefer Park Tank Farm, along an abandoned sewer line, to an abandoned sewer line manhole adjacent to the beachfront.

The 24-inch-diameter abandoned sewer line was constructed of vitrified clay in 2-foot-long sections with mortared joints and no gravel bedding. The abandoned sewer line was previously used to discharge wastewater that originated from a water treatment plant at the North Kingstown Municipal Golf Course and overflow from a main sanitary sewer line on Roger Williams Way. Most of the abandoned sewer line was removed at an unknown time (but prior to 1983), leaving behind a portion of the line along the western boundary of the Kiefer Park FUDS Project (south of Circuit Drive). In 1983, RIPA reportedly evacuated 4,200 gallons of a water/sewage/jet fuel mixture, including approximately 200 gallons of jet fuel, from the abandoned sewer line. In 1992, USACE filled this remaining portion of the abandoned sewer line with concrete slurry introduced through a brick manhole located at the southern end of the sewer line, near the southern end of the walking path.

Twelve soil borings were advanced in the study area, and six of these were completed as 1-inch diameter groundwater monitoring wells. Soil and groundwater samples were submitted for laboratory analysis of TPH. Analysis of soil samples identified TPH concentrations in specific isolated areas adjacent to the abandoned sewer line. These limited areas of contamination were not contiguous, suggesting that breaks in the abandoned sewer line allowed jet fuel to enter the soil from within the line. It did not appear that the contamination was traveling along the bedding of the abandoned sewer line itself.

TPH was also detected in groundwater samples collected throughout the length of the abandoned sewer line at generally low, but consistent levels. The concentrations of TPH in wells near the former interceptor trench at the

Kiefer Park Tank Farm FUDS Project were considerably higher than concentrations along the abandoned sewer line.

Source area remediation further inland was recommended as a remedial effort. It was believed that excavation and off-site disposal of soil in the area within and immediately west and south of the former interceptor trench would eliminate an apparently isolated area of contamination. It was determined that other areas of contamination along the abandoned sewer line could have been responsible for the periodic seepage observations at the beach, however, as constituent concentrations did not exceed RIDEM standards, a decision was made not to remove these apparently isolated areas of TPH in soils.

The Limited Site Investigation concluded that the existing wells at the Site should be monitored periodically to indicate whether LNAPL or sheens were present in any of the wells, and under what conditions the LNAPL appears. A long-term monitoring program was also recommended for use in developing a trend of LNAPL occurrences and contaminant concentration fluctuations in groundwater along the abandoned sewer line.

3.1.12 Geophysical Survey, 2009

Several lines of evidence indicated that the source of the COVCs in groundwater was in the western side of the Project Area. This premise was based on a combination of information sources, including but not limited to: the historical aerial photograph interpretation study (USAGC, 2010); historical data for CVOCs in soil gas (GZA, 1992); and the CVOC plume in groundwater geometry emanating from this side of the Project (e.g., GZA, 1992; EA, 2006; USACE, 2009).

In October 2009, a geophysical survey was performed to identify possible underground storage tanks (USTs), buried drums, or other sources of TCE and related CVOCs (Figure 3-12) (Hager-Richter, 2009). The geophysical survey was conducted by Hager-Richter Geoscience using ground-penetrating radar (GPR) and electromagnetic methods (EM-61). This investigation focused on the area around OW-9, which is to the west of the Hayward building. This area was selected based on historical soil gas and groundwater data, which indicated this area contained the highest TCE concentrations. The subsurface survey was able to penetrate to a depth of between 8 to 10 feet below the ground surface. The following conclusions were drawn based on the results of the geophysical survey:

- Two broad areas of high amplitude EM anomalies not attributable to surface metal, but attributed to buried metal, were identified. These areas were further investigated via GPR.
- GPR results showed eight large unidentified buried metal objects in the survey area, at depths of approximately 2 to 4 feet. The GPR reflections were consistent with those expected from a possible drum or small UST.
- Four large unidentified buried non-metallic objects were present in the survey area. The GPR reflections were consistent with those expected from a possible non-metal drum or small UST.
- Several possible utility segments and many small unidentified buried objects were detected in the survey area.

Based on these results, a geophysical anomaly investigation was conducted in 2011 (Mabbett, 2012). The results of that investigation are described in Section 3.2.1.

3.1.13 USACE Groundwater Monitoring, 2005-2009

USACE sampled selected groundwater monitoring wells for VOC analysis in 2005, 2006, 2007, 2008, and 2009 (USACE, 2009). Additionally, groundwater samples were analyzed for metals in 2008. Notably, over this 4-year period the TCE concentration in monitoring well OW-9 was 262 µg/L in 2005, decreased to 89.5 µg/L in 2007, was 273 µg/L in 2008, and 212 µg/L in 2009 (average concentration of 218 µg/L). Additionally, the monitoring event in

2005 was the first time a groundwater sample was collected from monitoring well W98-1, which is located on the far western border of Red Maple Swamp. From 2005-2009, the TCE concentration in W98-1 ranged from 24.4 µg/L to 31.0 µg/L.

3.1.14 Soil Vapor Sampling, 2006

Based on the soil vapor investigations conducted at the Blue Beach FUDS Project and Kiefer Park FUDS Project in 1992 (GZA, 1992), the locations of TCE and PCE in soil vapor samples collected at approximately 3 feet bgs and 6 feet bgs generally corresponded to the locations of the underlying TCE and PCE CVOC groundwater plumes. Two distinct areas of TCE and PCE in soil vapor samples were observed: on the western side of the Project (near the geophysical anomaly area and where the Hayward facility was later constructed), and on the eastern side of the Project south of the former General Dynamics salvage yard and near the Phase 2 PCB Remediation Area.

CVOCs were not detected in soil vapor samples collected from the Kiefer Park FUDS Project (GZA, 1992). These results served as the basis for many of the subsequent investigations to assess the nature and extent of contamination and identify potential source areas at the Site (e.g., GZA, 1994; GZA, 1997). It is also noted that subsequent to these investigations, the Hayward facility was constructed in 2004/2005 with a sub-slab depressurization system (SSDS) to mitigate potential vapor intrusion risk.

In 2006, a soil vapor investigation was performed in the areas where Hayward planned to expand their building footprint (EA, 2006). Soil vapor samples were collected from ten locations at a depth interval of 8 to 12 feet bgs and analyzed for VOCs and TPH. Of these ten samples, six were located on the Blue Beach FUDS Project, and four on the Kiefer Park FUDS Project.

One sample (EA04VP) was located just east of the geophysical anomaly area, under what is now the expanded Hayward facility (Figure 3-13). Soil vapor in this sample contained PCE at 6.2 micrograms per cubic meter of air (µg/m^3); other CVOC concentrations in this sample were non-detect (Table 3-1). In total, PCE was detected in soil vapor samples collected from two locations, ranging from 3.3 to 6.7 µg/m^3, on the western and central areas of the Project. However, in the northeast portion of the Blue Beach Project, between the Kiefer Park FUDS Project and Whitecap Drive, soil vapor in sample EA27VP contained *cis*-1,2-DCE at a concentration of 51 µg/m^3, *trans*-1,2-DCE at a concentration of 18 µg/m^3, and vinyl chloride (VC) at a concentration of 180 µg/m^3.

It was unclear where the source of CVOCs detected in these samples was located. However, the source is possibly from general historic waste disposal activities in this area. It was noted that at each soil vapor sampling location, a separate soil sample was collected from the boring. None of the ten soil samples contained CVOCs above laboratory instrument method reporting limits. In the soil vapor sample EA26VP, located on northern portion of the Blue Beach FUDS Project and adjacent to the Kiefer Park Tank Farm FUDS Project, benzene was detected at a concentration of 160 µg/m^3. The source of benzene in the area is likely the former Kiefer Park Tank Farm.

3.1.15 Blue Beach/Kiefer Park – Quonset Point, Rhode Island, Examination of Historical Photography

The USAGC examined relevant historical aerial photography spanning 1938 to 2009 to assess potential areas of open storage as the source of TCE plume contamination (which had been previously investigated at the Project site) (USAGC, 2010). Other features such as buildings, storage tanks, ground scars, disturbed ground, fill areas, and ponds were also included in this report as findings.

Examination of aerial photos flown from 1945 to the 1960s offer findings which relate to the geographic location of an identified TCE plume source. The southern area of the Former Kiefer Park Tank Farm (prior to the installation of Tanks 538, 539, and 540) displays a grouping of three structures (1945-1949) located immediately south of an aircraft salvage yard (1945). Areas of ground scars are identified on late 1940s oblique aerial photography over the TCE plume area. A 13,500-barrel jet fuel storage tank (No. 538), installed in the early 1950s, lies within the northern-most section of the TCE plume. An activity area (type unknown) – a probable open storage area, is

observed on 1954 aerial photography. On aerial photos dated from the 1950s to the 1960s, there are various materials typical of salvage operations in open storage located within the plume area and extensively at the Blue Beach Salvage Yard lying just east of the TCE plume. A fuel truck loading stand, built circa 1963 and associated with Storage Tank No. 538, appears at the northern portion of the TCE plume. Finally, a review of 1970 aerial photography indicates a large amount of open storage over the TCE plume area.

3.2 Former Kiefer Park Tank Farm

The Former Kiefer Park Tank Farm FUDS Project, which borders the Site to the north and west, has been identified as the source of petroleum compounds impacting the Site (Watermark, 2011; Mabbett, 2015b). The Former Kiefer Park Tank Farm FUDS was the location of the former Kiefer Park Tank Farm, which housed three aviation gasoline (avgas) and three jet fuel USTs and associated transfer piping from 1940 to 1974. The removal of these USTs and associated piping in 1989/1990 eliminated any ongoing potential source of fuel oil releases to the Kiefer Park Tank Farm FUDS Project and the Site (Mabbett, 2015b). The source of the release of avgas and jet fuel at Kiefer Park appeared to be associated primarily with the former USTs (number 539 and 540), which were located in the southern portion of the former Kiefer Park Tank Farm (south of Circuit Drive), and from the former fuel truck loading area piping in the southeastern area of the former Tank Farm.

3.2.1 Remedial Actions at the Former Kiefer Park Tank Farm FUDS

In 2003-2004, USACE constructed a LNAPL recovery system spanning the southeastern portion of the Kiefer Park FUDS and the central portion of the Blue Beach FUDS (Figure 3-14; Conti, 2005). At that time, regulators and other consultants theorized that LNAPL that had been previously measured in groundwater monitoring wells was actively migrating in the subsurface vadose zone and groundwater toward the south/southwest from the former Tank Farm (CDW, 2002). As part of the LNAPL recovery system construction, USACE excavated nearly 1,400 CY of petroleum-contaminated soil, which was transported off-site for disposal (Conti, 2003; Conti, 2005). USACE began operating the LNAPL recovery system in 2004 (Conti, 2005). However, after approximately one year of operation, no LNAPL had migrated into the LNAPL recovery system (Conti, 2005). Accordingly, in 2005 USACE halted operation of the LNAPL recovery system, determining that the fluctuating levels of LNAPL previously measured in groundwater monitoring wells was not due to horizontal or vertical LNAPL migration, but was instead an artifact of lowering and rising groundwater levels (Conti, 2005).

To further assess LNAPL potential mobility and recoverability, USACE completed an LNAPL investigation of the former Kiefer Park Tank Farm in 2011 (Watermark, 2011) and a subsequent investigation for residual petroleum to the west of the Kiefer Park FUDS Project, along the northern portion of Red Maple Swamp in 2013 (Mabbett, 2015b). The 2011 investigation used water drive and centrifugal testing to conclude that the LNAPL present in subsurface soils was not readily mobile or recoverable, and that the historical intermittent observations of fluctuating LNAPL thicknesses in selected groundwater monitoring wells in vicinity of the former tanks and piping was an artifact of the physical mechanisms related to groundwater levels, soil porosity, and petroleum dynamics (Interstate Research Council, 2009; Watermark, 2010).

The 2013 investigation confirmed that LNAPL was not present beyond the western border of the Kiefer Park FUDS Project (Mabbett, 2015b). Based on these data, in 2014 USACE permanently decommissioned the shed housing the former LNAPL recovery system controls and removed the shed from the Hayward parking lot. Additionally, in 2015 USACE submitted a request to RIDEM for an Interim Letter of Compliance (ILOC), documenting that USACE has completed remedial efforts at the Kiefer Park FUDS Project; acknowledging that LNAPL and residual petroleum remained present at the Kiefer Park FUDS above RIDEM upper concentration limits (UCL) and leachability criteria; and that long-term monitoring of dissolved-phase petroleum in groundwater will continue until such time that applicable RIDEM soil and groundwater objectives are achieved (Mabbett, 2015b).

As part of the ILOC approval process requested by RIDEM in June 2015, USACE prepared an updated long-term monitoring plan for groundwater; and ELUR/SMPs for the parcels currently without these controls and where dissolved-phase petroleum from the Kiefer Park FUDS Project had migrated. These parcels include the Walking Path, Red Maple Swamp, the Blue Beach Public Parking Lot, and the parcel occupied by Hexagon Metrology. The owner of these parcels, RICC, submitted the ELUR/SMPs on the deeds of these properties on April 16, 2018. The ELURs prohibit unrestricted residential activity and groundwater for potable uses at each parcel, while the SMPs control future exposure to and handling of petroleum-contaminated soil.

The dissolved-phase petroleum compounds in groundwater associated with the Kiefer Park Tank Farm FUDS Project former tank farm source area include naphthalene, benzene, ethylbenzene, methylene chloride, and bis(2-ethylhexyl)phthalate, with co-mingled metals including arsenic, chromium, and lead. The RIDEM GA exceedances of the VOCs benzene, ethylbenzene, and methylene chloride are mostly found in the northern portion of the former Kiefer Park Tank Farm (north of Circuit Drive) and attenuate to below RIDEM GA Groundwater Objectives within Red Maple Swamp. Likewise, bis(2-ethylhexyl)phthalate and the metals attenuate to below RIDEM GA Groundwater Objectives in Red Maple Swamp. All of the groundwater samples collected by the Army Corps during the Blue Beach RI were collected using the EPA low-flow methodology. It is noted that the exceedances of the RIDEM GA Groundwater Objectives for metals are generally based on historical groundwater data, which may have been influenced by the turbidity. Therefore, the metals data may be biased high, and should be considered conservative from a risk evaluation standpoint. Additionally, groundwater data collected since 2008 from permanent monitoring wells using low stress/low-flow methods do not indicate significant levels of metals in groundwater.

Based on these soil and groundwater data, residual petroleum in vadose zone soils attributed to the Kiefer Park FUDS Project appears to act as a source of dissolved-phase petroleum compounds to groundwater, which migrates onto the Site (Mabbett, 2015b). The Former Blue Beach Disposal Area FUDS RI addresses these compounds in context of the risk assessment and nature and extent; however, by design a Feasibility Study for the Site would not include remedies to address contamination originating from the Kiefer Park Tank Farm FUDS Project.

3.2.2 Former Kiefer Park Interceptor Trench

Based on data from the 2011-2014 investigations and historical investigations, contaminated sediments present in the former interceptor trench installed by QDC, which is located within the Kiefer Park FUDS Project on its western border (Figure 3-15), appear to be a potential source of the contaminants present in Red Maple Swamp, namely pesticides, metals, petroleum, PCBs (Aroclor 1260), VOCs, and SVOCs. A summary of the former interceptor trench sediment and surface water analytical data is presented in Tables 3-2 and 3-3, respectively. During periods of high precipitation, the former interceptor trench becomes saturated, and sediments may become mobilized in the surface water column; as surface water flows westward out of the former interceptor trench, it carries sediment with it, migrating westward through the rip-rap-lined channel under the walking path foot bridge, then discharging near QDC Outfall 026 and ultimately transported further downgradient via the tidal stream in Red Maple Swamp.

Metals detected in sediment samples included aluminum, arsenic, barium, cadmium, chromium, cobalt, copper, lead, magnesium, manganese, mercury, vanadium, zinc (Table 3-2). Trace levels of PCBs were detected in sediment samples as Aroclor 1260. Trace levels of pesticides detected in sediment samples included 4,4'-DDD; 4,4'-DDE; 4,4'-DDT (in 1994 only), aldrin (in 1994 only), alpha-chlordane (in 1994 only), Endosulfan II, and Endosulfan sulfate (in 1994 only), endrin aldehyde (in 1994 only), endrin ketone, and gamma-chlordane (in 1994 only). SVOCs detected in sediment included PAHs, di-n-butyl phthalate, and dibenzofuran. VOCs detected in sediment included 1,2,4-trimethylbenzene, MEK, benzene, naphthalene, and total xylenes. TPH was also reported in sediment samples.

Surface water in the former interceptor trench was sampled in 1986, 1994, 2011, and 2012. Chemicals detected during one or more of these events included metals, VOCs, and SVOCs. A summary of the analytical data for surface samples collected from the former interceptor trench is provided in Table 3-3. Dissolved metals in surface water in the former interceptor trench included barium, cadmium, and chromium. Total metals detected in surface water included arsenic, barium, cadmium, and lead, and were detected at higher concentrations than dissolved metals, with the exception of arsenic (total = 0.8J µg/L, dissolved was nondetect at 2.5U µg/L) and chromium (total was nondetect at 10U µg/L and dissolved = 2.2J µg/L). Such inconsistencies around the reporting limits are not unusual and are not of concern. Dissolved metals detected in surface water in the former interceptor trench included barium, cadmium, and chromium. VOCs detected in surface water in the former interceptor trench included 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 4-isopropyltoluene; ethylbenzene; isopropylbenzene; n-propylbenzene; naphthalene, *sec*-butylbenzene; *tert*-butylbenzene; toluene; and p,m-xylenes. The only SVOC detected in surface water was di-n-butyl phthalate at 140 to 160 µg/L in 1994. A surface water sample collected in 1994 contained TPH at a concentration of 0.16 mg/L.

The source of the contaminants present in the former interceptor trench is believed to be from general historical activities at the former Kiefer Park Tank Farm.

3.3 Recent Site Investigations, 2011-2020

This section provides a summary of the recent investigations conducted by USACE under the FUDS program between 2011 and 2020 by Mabbett. The primary goals of the 2011-2020 investigations were to address specific data gaps identified in the prior investigations; to refine the preliminary CSM presented in the 2011 investigation/FS Work Plan (Watermark, 2011); to assess the geophysical anomaly area for sources of CVOCs and other constituents in groundwater; and to provide an environmental sampling dataset that is sufficiently robust to support a CERLCA-compliant human health and ecological risk assessment.

The 2011-2020 investigations were conducted in four tiered phases: the first phase was conducted in October-December 2011; the second phase in July-August 2014; the third phase in August-September 2015; and the fourth phase in 2019-2020. Each investigation was performed according to USACE-approved Work Plans (Watermark, 2011; Mabbett, 2014; Mabbett, 2015; Mabbett 2019). The specific methods used, and analytical data generated during these investigations is summarized in the 2011, 2014-2015, and 2019-2020 Trip Reports (Mabbett, 2012; Mabbett, 2016; Mabbett, 2020).

As described below, the 2011 investigations were conducted to identify the location and extent of source areas remaining on the Project Area following previous targeted remedial actions. Since 2011, additional waste materials were removed from the Project Area and additional remedial measures were taken on the Former Kiefer Park Tank Farm. Therefore, the data collected after these additional remedial measures (2014 and 2019) are most representative of current conditions and were the data set used for the baseline risk assessment discussed in Section 7.0.

3.3.1 2011 Investigation

3.3.1.1 Rationale

The primary goal of the 2011 investigation was to assess the geophysical anomaly area for potential sources of the constituents previously identified in groundwater. Additional goals of the 2011 investigation included expanding the monitoring well network and collecting additional groundwater, sediment, surface water, pore water, hydric soil, and surface and subsurface soil samples for analysis to better assess the nature and extent of contamination identified in previous investigations and address data gaps identified in the 2011 preliminary CSM. The 2011 investigation data were also to be evaluated in the CERCLA-compliant human health and ecological risk assessments in this RI. Details of the 2011 investigation were presented in the Field Trip Report (Mabbett, 2012).

3.3.1.2 Summary of Tasks

Tasks conducted during the 2011 investigation included the following:

- Two test pits were excavated where subsurface geophysical anomalies were identified in 2009 (Hager-Richter, 2009) (Figure 3-12). Several crushed, corroded 55-gallon metal drums were unearthed. Samples of *de minimis* amounts of residual "fluffy" material were collected from drums and analyzed for VOCs, semi-volatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), PCBs, and metals. Likewise, subsurface soil samples under each drum were collected and analyzed for the same parameters. A sample of "white powder" from a full 55-gallon drum was analyzed for the same parameters. Yellow paint residue was also encountered in the base of one of the drums of which a sample was collected by Mabbett. A length of polyethylene sheeting was placed over the drums prior to backfill. Groundwater samples subsequently collected from OW-9 showed a decrease in TCE concentrations, a trend which continues to this day. A summary of the 2011 geophysical anomaly area observations is provided in Table 3-4. A summary of the waste profile chemical data is provided in Table 3-5. A summary of the soil chemical data is provided in Table 3-6.
- Eleven shallow overburden groundwater monitoring wells were installed to increase spatial coverage of groundwater across the Site. At least one subsurface (>2 feet bgs) soil sample was collected from each soil boring core and analyzed for VOCs, Resource Conservation and Recovery Act (RCRA) 8 metals, and biological parameters. The 11 new monitoring wells and 18 existing monitoring wells were sampled and analyzed for VOCs (Figure 3-16).
- Five pore water samples were collected within Red Maple Swamp and analyzed for VOCs, PCBs, and RCRA 8 metals (total and dissolved) (Figure 3-17).
- Three co-located shallow (0 to 0.5 foot bgs) sediment and surface water samples were collected from the Red Maple Swamp tidal stream; one from the surficial drainage ditch upgradient from the tidal stream; and one from the former interceptor trench on the Kiefer Park FUDS Project. Samples were analyzed for VOCs, PCBs, and RCRA 8 metals (total and dissolved for surface water samples) (Figure 3-17).
- Twelve shallow (0-1 foot bgs, 1-2 feet bgs) hydric soil samples were collected from six locations in Red Maple Swamp and analyzed for VOCs, PCBs, and RCRA 8 metals (Figure 3-18).
- Twelve shallow (0-1 foot bgs, 1-2 feet bgs) soil samples were collected from six locations along the Walking Path and analyzed for VOCs, PCBs, and RCRA 8 metals (Figure 3-18).
- A synoptic groundwater elevation survey was performed to assess and confirm groundwater flow directions indicated in historical investigations. Wells were also assessed for the presence and thickness of LNAPL and DNAPL.
- A ground elevation survey was conducted for sampling locations and relevant physical site features.

All samples submitted for laboratory analysis were analyzed by ESS Laboratory in Cranston, Rhode Island. The data collected during the 2011 investigation were qualified by the laboratory and validated by Mabbett using the USACE Automated Data Review (ADR) software. The validated analytical data collected during the 2011 investigation are presented in Section 5.0. Further discussions of sampling deviations, data quality, validation processes, and usability were presented in the 2011 Investigation Field Trip Report (Mabbett, 2012).

3.3.2 2011 Geophysical Anomaly Area Findings and Debris Removal

Two distinct areas were investigated during the subsurface excavation investigation of the geophysical anomaly area conducted as part of the 2011 investigation (Mabbett, 2012). During this subsurface investigation, the two areas were excavated to a depth of approximately 8 feet bgs. Observations during the investigation identified six

isolated crushed drums containing less than a handful of "fluffy" brown material, a hardened mass of yellow paint (equivalent to less than a 5 gallon container in size), an intact drum containing an unknown white powder, a metal 5-sided box containing approximately 0.5 to 1 cy of an unknown granular black media, an airplane landing arm with an attached wheel, and significant amounts of buried metal cable and metal, possibly siding from a Quonset hut. Other objects encountered included a refrigerator, a radiator, flexible pipe, and small metal containers appearing to contain electrical components suspected to be ship communication fuses wrapped in paper. Figure 3-19 shows the locations where debris was observed during the geophysical anomaly investigation. Table 3-4 presents a summary of these observations. Appendix C of the 2012 Mabbett report presents photographs of the geophysical anomaly investigation.

Samples were collected and analyzed of the different materials. Concentrations of VOCs and CVOCs were reported in the "fluffy" brown material, hardened paint, and granular media, and concentrations of metals were reported in the hardened paint, granular media, and at lower concentrations in the white powder. The geophysical anomaly waste sample chemical data are presented in Table 3-5. Two samples of the "fluffy" brown material were collected and contained elevated CVOC, VOC, and metal concentrations. Some of the higher CVOC concentrations included:

- PCE – 55,800 µg/kg
- TCE – 814,000 µg/kg and 120,000 µg/kg
- *cis*-1,2-DCE – 133,000 µg/kg

A sample of the hardened yellow paint contained TCE at a concentration of 85,700 µg/kg. The granular black media from the metal box had TCE at a concentration of 44.9 µg/kg.

Other detected VOCs in these wastes included 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; 2-butanone/methyl ethyl ketone (MEK), 4-isopropyltoluene; 4-methyl-2-pentanone; BTEX; isopropylbenzene; methylene chloride; naphthalene; n-propyl benzene; and *sec*-butyl benzene. Detected metals in these wastes included arsenic, barium, cadmium, chromium, lead, mercury, and silver. Approximately 20 CY of metal and associated debris originating from the geophysical anomaly area were contained in a polyethylene-lined roll-off container and transported off-site for disposal.

Concurrently with the geophysical anomaly area investigation, soil samples were collected from the base of each test pit and underlying the buried drums. The soil samples were reported with CVOC, VOC, and metal concentrations. The soil sample analytical data from these test pits is presented in Table 3-6, with a comparison of analytical results to the EPA Regional Screening Levels (RSLs) for Resident Soil. CVOC concentrations included:

- PCE: detected in three soil samples at concentrations that ranged from 50.9 to 165 µg/kg.
- TCE: detected in six soil samples at concentrations ranging from 1.8 to 2,580 µg/kg; the two highest concentrations (2,140 and 2,580 µg/kg) were detected in soil samples collected from beneath the crushed drums containing brown "fluffy" debris.
- *cis*-1,2-DCE: detected in three soil samples at concentrations that ranged from 86.6 to 153 µg/kg.
- 1,1-DCA: detected in one soil sample at 48.5 µg/kg.

Other detected VOCs in these soil samples included 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; MEK; 4-isopropyltoluene; 4-methyl-2-pentanone; BTEX; isopropylbenzene; methylene chloride; naphthalene; n-propyl benzene; and *sec*-butyl benzene. The same VOCs were detected in the waste materials present in the geophysical anomaly area. Detected metals in these soil samples included arsenic, barium, cadmium, chromium, and lead. These metals were also detected in the waste samples.

3.3.3 2014 Investigation

3.3.3.1 Rationale

The primary goal of the 2014 investigation was to better refine the horizontal and vertical extent of CVOCs in groundwater migrating south and west from the geophysical anomaly area, which is the presumed source of CVOCs in groundwater, by conducting a vertical groundwater profiling investigation upgradient and downgradient from the source area. Details of the 2014 investigation were presented in the 2014-2015 Trip Report (Mabbett, 2016). Additional goals included repeating the 2011 investigation sampling effort at permanent groundwater monitoring wells, pore water sample locations, and co-located sediment and surface water locations. Furthermore, the Blue Beach inter-tidal beachfront sediment was sampled and analyzed for constituents potentially migrating from groundwater to sediment. The 2014 investigation data was used to refine the CSM and the data were evaluated in the human health and ecological risk assessments for the Comprehensive RI.

3.3.3.2 Summary of Tasks

Tasks conducted during the 2014 investigation included the following:

- Five shallow (1 foot bgs) pore water samples were collected within Red Maple Swamp at similar locations as the 2011 investigation. The samples were analyzed for VOCs and RCRA 8 metals (filtered and non-filtered) (Figure 3-20).
- Co-located sediment and surface water samples were collected from three locations within Red Maple Swamp (Figure 3-21), similar to the 2011 investigation. The samples were analyzed for VOCs and RCRA 8 metals (filtered and non-filtered for aqueous media). Sediment samples were also collected from the surficial drainage ditch (between QDC Outfalls 025 and 026) and the former interceptor trench at the Kiefer Park Tank Farm FUDS and analyzed for VOCs, RCRA 8 metals, SVOCs, PCBs, and TPH; surface water was not present at these two locations when the sediment samples were collected.
- Shallow sediment (0 to 0.5 foot bgs) samples were collected from eight locations along the Blue Beach beachfront and analyzed for VOCs and RCRA 8 metals (Figure 3-22). The samples were spaced approximately evenly across the length of the beachfront parcel owned by QDC. The samples were collected during low tide between the mid-tide and low-tide lines.
- Groundwater samples were collected from 34 monitoring wells for analysis of VOCs and RCRA 8 metals (filtered and non-filtered) (Figure 3-23).
- Vertical groundwater profiling was performed at 22 locations (Figure 3-24). The objective of the vertical groundwater profiling task was to further delineate the vertical and horizontal extent of CVOCs and metals in groundwater migrating west and south from the geophysical anomaly area (the presumed CVOC source area). The samples were collected for VOCs and RCRA 8 metals (filtered and non-filtered).
- A synoptic groundwater elevation survey was performed to confirm prior groundwater flow directions. Wells were also assessed for the presence and thickness of LNAPL and DNAPL.
- A ground elevation survey was conducted of sampling locations and relevant physical site features.

All samples submitted for RCRA 8 metals, SVOCs, PCBs, and TPH were analyzed by ESS Laboratory in Cranston, Rhode Island. Samples for VOCs were analyzed by Mabbett's subcontracted on-site mobile laboratory operated by ECCS Nationwide Mobile Laboratory. The data collected during the 2014 investigation were qualified by each laboratory and validated by Mabbett using the USACE ADR software. The validated analytical data collected during the 2014 investigation are presented in Section 5.0.

3.3.4 2015 Investigation

3.3.4.1 Rationale

The primary goal of the 2015 investigation was to assess sediment, porewater, and surface water along the Blue Beach beachfront area for constituents that may have migrated to these media from upgradient groundwater. Details of the 2015 investigation were presented in the 2014-2015 Field Trip Report (Mabbett, 2016).

An additional goal was to conduct a seismic survey to assess the bedrock topography to the west and south of the source area. Although all previous investigations indicated low-level CVOC concentrations (e.g., low parts per billion [µg/L] levels not indicative of a DNAPL source) in groundwater, the seismic survey was requested by RIDEM out of concern that if bedrock depressions were present these depressions could be harboring pools of DNAPL, and the depressions would be the recommended locations for deep overburden groundwater wells, if needed. The 2015 investigation data were used to refine the CSM and evaluated in the human health and ecological risk assessments in the Comprehensive RI.

3.3.4.2 Summary of Tasks

Tasks conducted during the 2015 investigation included the following:

- On-shore shallow sediment (0- to 0.5-foot bgs) samples were collected from two locations along the Blue Beach beachfront and analyzed for VOCs and RCRA 8 metals (Figure 3-25). The samples were collected along a portion of the beachfront owned by QDC. The samples were collected between the mid-tide and low-tide lines, within the eastern portion of the beachfront. These two sediment samples increased the number of on-shore intertidal data points to 10, thereby facilitating the use of ProUCL for the CERCLA-compliant risk assessments.
- On-shore shallow (1-foot bgs) pore water samples were collected from 10 locations (co-located with the beachfront sediment samples) along the Blue Beach beachfront and analyzed for VOCs and RCRA 8 metals (filtered and non-filtered) (Figure 3-25). The porewater samples were collected between the mid-tide and low-tide lines during an outgoing tide.
- Off-shore shallow (0- to 0.5-foot bgs) sediment samples were collected from 10 locations approximately 50 feet off-shore and aligned with the 10 on-shore sediment sample locations. The samples were analyzed for VOCs and RCRA 8 metals (Figure 3-25).
- Off-shore shallow (1-foot bgs) porewater samples were collected from 10 locations co-located with the off-shore sediment samples. The porewater samples were analyzed for VOCs and RCRA 8 metals (filtered and non-filtered) (Figure 3-25).
- Off-shore surface water (mid-column) was collected from Narragansett Bay at three locations where off-shore sediment/pore water samples were collected. Surface water was collected 50 feet off-shore and at the eastern, western, and central areas of the off-shore sampling transect. The surface water samples were analyzed for VOCs and RCRA 8 metals (filtered and non-filtered) (Figure 3-25).
- Seismic survey to map bedrock topography in the western portion of the Site.
- A ground elevation survey of sampling locations and relevant physical site features.

All samples submitted for VOC and RCRA 8 metals were analyzed by Accutest Laboratory in Marlborough, Massachusetts. Details of the 2015 investigation were presented in the 2014-2015 Field Trip Report (Mabbett, 2016). The data collected during the 2015 investigation were qualified by each laboratory and validated by Mabbett using the USACE ADR software. The validated analytical data collected during the 2015 investigation are presented in Section 5.0.

3.3.5 2019-2020 Investigation

3.3.5.1 Rationale

The primary goal of the 2019-2020 investigation was to further assess upland soil, hydric soil, sediment, and groundwater to provide additional support to the risk assessments; and to provide additional data (sediment toxicity testing and an invertebrate survey) for the ecological risk assessment at on-Project and off-Project locations. In addition, a background sampling program was conducted to collect a representative data set for comparison with Site data to support the human health and ecological assessments and conclusions regarding naturally occurring or anthropogenic sources not associated with the Former Blue Beach Disposal area. Details of the 2019-2020 investigation were presented in the 2019-2020 Field Trip Report (Mabbett, 2020).

3.3.5.2 Summary of Tasks

Tasks conducted during the 2019-2020 investigation included the following:

- Discrete surface (0-1 foot bgs) and subsurface (1-3 foot bgs) soil samples were collected from on-Project upland soil locations BG-5 (SB-301 through SB-303) and BG-1 (SB-304 through SB-306). The samples were analyzed for SVOCs and TAL metals. A subset of samples was also submitted for laboratory analysis of TOC and grain size (Figure 3-26).
- Triplicate incremental sampling methodology (ISM) soil samples were collected from surface (0-1 foot) and subsurface (1-3 foot) soil at BG-1 and BG-5 (six samples total) and submitted for laboratory analysis of PCBs (Figure 3-26). The objective of these samples was to determine a representative average concentration of PCBs in soil at these 1988 sampling locations where PCBs were detected during the Contaminant Confirmation Study (Section 3.1.2).
- Surface (0-1 foot bgs) and subsurface (1-3 foot bgs) soil samples were collected from 20 upland soil boring locations (SB-307 through SB-326) along the southern and western portions of the Site. Soil samples were analyzed for VOCs, SVOCs, and TAL metals (Figure 3-26).
- Surface (0-1 foot bgs) and subsurface (1-3 foot bgs) ISM soil samples were collected from upland soils to the south of the Hayward building (UPS-1 through UPS-3). These ISM soil samples were submitted for laboratory analysis of PCBs (Figure 3-26).
- Ten shallow soil samples (0-1 foot bgs) were collected from the walking path leading from the Circuit Drive parking area to the shoreline of Narragansett Bay (SB-327 through SB-336) and analyzed for SVOCs/PAHs, PCBs, and TAL metals. A subset of these samples was also analyzed for TOC and grain size (Figure 3-26).
- Ten shallow sediment samples (0-1 foot bgs) were collected from the intertidal zone along the shoreline of Blue Beach (SED-301 through SED-310) for laboratory analysis of PCBs and TAL metals. A subset of the samples was also analyzed for TOC and grain size (Figure 3-26).
- 20 shallow sediment samples (0-0.5 foot bgs) were collected from the Red Maple Swamp tidal stream (SED-321 through SED-340) for laboratory analysis of SVOCs/PAHs, PCBs, and TAL metals. A subset of the samples was also analyzed for TOC and grain size (Figure 3-26).
- 20 hydric soil samples were collected from ten locations at the 0-1 and 1-2 foot bgs intervals from the Red Maple Swamp interior (SSH-301 through SSH-310). Samples were analyzed for SVOCs/PAHs, PCBs, and TAL metals. A subset of samples was also analyzed for TOC and grain size (Figure 3-26).
- Groundwater samples were collected from 38 monitoring wells for laboratory analysis of VOCs, SVOCs/PAHs, PCBs, and TAL metals (filtered and unfiltered) (Figure 3-27).

- Background upland surface (0- to 1-foot bgs) and subsurface (1- to 3-foot bgs) soil samples were collected from 20 locations at Rome Point State Park (SB-401 through SB-420) and submitted for analysis of PAHs and TAL metals. A subset of samples was also analyzed for TOC and grain size (Figure 3-28).
- Background hydric soil samples were collected from 2 depth intervals (0-1 and 1-2 foot bgs) from ten locations within a coastal wetland area at Rome Point State Park (SSH-311 through SSH-320). Soil samples were submitted for laboratory analysis of PAHs, PCBs, and TAL metals. A subset of the samples was also analyzed for TOC and grain size (Figure 3-28).
- Ten shallow sediment samples (0-1 foot bgs) were collected from the intertidal zone along the shoreline of the beach at Rome Point State Park (SED-311 through SED-320). Sediment samples were submitted for laboratory analysis of TAL metals. A subset of the samples was also submitted for laboratory analysis of TOC and grain size (Figure 3-28).
- Five off-Project upstream sediment samples (background) samples were collected for sediment toxicity testing, macroinvertebrates survey, and analysis for acid volatile sulfide/simultaneously extracted metals (AVS/SEM) to support the ecological risk assessment (SED-321 through SED-325 on Figure 3-26).

All environmental samples submitted for chemistry analysis were analyzed by Katahdin Analytical in Scarborough, Maine. Details of the 2019-2020 investigation were presented in the Field Trip Report (Mabbett, 2020). The data collected during the 2019-2020 investigation were qualified by Katahdin and validated by Laboratory Data Consultants (LDC) of Carlsbad, California using the USACE ADR software and in accordance with Stage 2A validation guidelines. The validated analytical data collected during the 2019-2020 investigation are presented in Section 5.0.

The sediment toxicity testing was performed by Enthalpy Analytical of Hampton, New Hampshire. Sediment samples collected for the macroinvertebrate survey were analyzed by Normandeau Associates of Bedford, New Hampshire.

4.0 PHYSICAL CHARACTERISTICS OF THE SITE

This section summarizes the physical characteristics of the Site and surrounding area, including topography, geology, and hydrology. Physical characteristics of the Site have been compiled using a combination of literature reviews, historical reports, and field measurements and observations from the 2011-2020 Mabbett investigation field programs.

4.1 Surface Features (Physiography)

4.1.1 Regional

The surface topography near the Site (from Quonset Point to a point approximately 5 miles west of Quonset Point) exhibits over 150 feet of relief in a series of north-south trending troughs/depressions and ridges (Figure 4-1). These troughs were developed by river and stream erosion and deepened by glacial activity. Surface drainage is not well developed, and swamps and marshes are extensive. Streams are small and, in most places, bordered by swamps.

Nearly all the surficial deposits are of glacial origin deposited during the Wisconsinan Glacial Stage of the Pleistocene Epoch. The glacial deposits record a single invasion of the ice sheet and are only slightly modified by post-glacial weathering and erosion (Schafer, 1961) (Figure 4-2). Portions of the land surface at the Quonset Business Park have undergone significant man-made modification, e.g., hills were leveled and depressions filled in as part of the original construction of the Base and during military training operations.

4.1.2 Site

Elevations in the general vicinity of the Site range from approximately 23 ft above mean sea level (MSL) at the northern end of the Site along Circuit Drive to mean sea level at the southern end of the Site along Narragansett Bay (Figure 4-3). Site topography generally slopes from north to south toward Narragansett Bay. The western border of the Project and the walking path are at slightly higher elevations than Red Maple Swamp.

4.2 Meteorology

The climate in eastern Rhode Island is considered humid continental with hot summers, cold winters, and high humidity year-round. The U.S. Department of Agriculture (USDA) classifies the area as Zone 6b (USDA, 2020). According to National Resources Conservation Service (NRCS) data for Washington County, from 1981-2010 the average temperature was 50.9°F; the average daily low temperature was 18.8°F (January); and the average daily high temperature was 69.9°F (July) (NRCS, 2020). The average humidity was 64 percent over a period between 2010 and 2020 (Wolfram Alpha, 2020). Average wind speed information collected from the Quonset State Airport (KOQU) between 2010 and 2020 was approximately 12 miles per hour (Wolfram Alpha, 2020). Similar to the rest of the northeastern seaboard, the North Kingstown area receives year-round precipitation. Average monthly precipitation ranges from a high of 5.54 inches in March to a low of 3.66 inches in July (The Weather Channel, 2020). Precipitation levels are generally lower in the summer months than in winter months. In winter months, powerful storms known as “nor’easters” can cause significant rain or snowfall and blizzard conditions.

4.3 Surface Water Features

4.3.1 General Surface Water Drainage

Surface water drainage flows southward across the Site toward Narragansett Bay by overland flow, with a component in the western portion of the Project flowing toward Red Maple Swamp due to the lower elevation of the latter. The tidal stream in Red Maple Swamp drains into Narragansett Bay near the Site's southwestern corner. Elsewhere on the Project, surface flow is likely influenced by the large areas of non-permeable surfaces (the majority of the Project is paved), and the permeability of the sandy surficial soil, as well as the topography.

Overland runoff from the area immediately upgradient from the Site flows generally eastward toward Narragansett Bay. Runoff originating from proximal areas between Roger Williams Way and Circuit Drive are directed to the site through a man-made earthen drainage channel (Figure 4-4). This earthen drainage channel begins south of Roger Williams Way and collects surficial storm water from landscaped areas between Roger Williams Way and Circuit Drive. The earthen drainage channel extends due south until Circuit Drive, where it travels beneath Circuit Drive through a concrete culvert. On the downstream side of the culvert (southern side of Circuit Drive), the drainage channel discharges to the northern portion of the Red Maple Swamp at QDC Outfall 025. The earthen drainage channel then continues south along the western border of the Blue Beach walking path, terminating at QDC Outfall 026, which is located at the northern head of the Red Maple Swamp tidal stream.

4.3.2 Red Maple Swamp

The Red Maple Swamp tidal stream extends south/southwest through Red Maple Swamp, turns west in the central portion of Red Maple Swamp, then turns south until it discharges into Narragansett Bay. During tidal cycles, Narragansett Bay seawater flows into the tidal stream, causing the tidal stream to reverse flow direction and become brackish up to Outfall 026. The tidal stream salinity, calculated as a function of temperature and conductivity, was measured most recently at three locations during an outgoing tide in 2014. The data indicated that salinity ranged from a maximum of 17.97 percent at location SW-5 located approximately 170 feet north from where the tidal stream discharges into Narragansett Bay; decreased to 0.15 percent at location SW-4 located approximately 650 feet upstream from SW-5; and was less than 0.01 percent at located SW-3 located at the northern head of the tidal stream at QDC Outfall 026 and approximately 400 feet upstream from SW-4 (Mabbett, 2016).

Red Maple Swamp also receives storm water originating from two storm drains on Roger Williams Way and one storm drain located in the landscaped grass field between Roger Williams Way and Circuit Drive (Figure 4-5) (QDC, 2012). The storm water is conveyed through an underground 36-inch diameter concrete pipe that passes underneath Circuit Drive and eventually discharges at QDC Outfall 026 (Figure 4-4).

Additional surface water inputs to the Red Maple Swamp include outflow from a surficial depression associated with a former interceptor trench located on the western side of the Kiefer Park FUDS Project. This man-made, shallow, seasonally-inundated depression is located between the western boundary of the former Kiefer Park Tank Farm and the Blue Beach public walking path. It is approximately 100 feet long (north to south), 10 to 20 feet wide (east to west), with an approximate area of 1,500 square feet. A man-made rip-rap lined surface water overflow discharge outlet is located on the southwestern end of the former interceptor trench. During periods of high precipitation and seasonal high groundwater elevation, surface water in the former interceptor trench flows west beneath the Blue Beach walking path foot bridge and merges with surface water just downstream from the QDC Outfall 026. Between 2002 and 2005 QDC constructed the elevated foot bridge and rip-rap lined drainage channel connecting the former interceptor trench to Red Maple Swamp. Prior to 2002-2005, the elevated grade of the earthen walking path served as a barrier to surface water in the former interceptor trench from flowing into Red Maple Swamp, except under conditions when “the area surrounding the interceptor trench remnant was inundated, with water flowing over the path toward the main body of the wetland [e.g., Red Maple Swamp]” (GZA, 1997).

Groundwater in the Red Maple Swamp is not considered to be accessible to residents due to non-CERCLA use restrictions, related to its status as a wetland, and existing provisions limiting earth disturbance in wetlands and recreation areas. Depth to groundwater exceeds the depth that could be caused by typical site use by visitors, recreators, adjacent residents, and adjacent site workers.

4.3.3 Onsite Interceptor Tench

In 1983, RIPA reportedly excavated all or a portion of the interceptor trench along the western border of the former Kiefer Park Tank Farm south of Circuit Drive (GZA, 1986). The trench was excavated to observe the presence of jet fuel breakouts at the toe of the slope. Absorbent pads were used to remove some jet fuel observed seeping from the excavated area at that time. The trench was not backfilled at that time and petroleum or water was never pumped from it. However, based on a comment letter dated November 28, 1995, from Rhode Island Economic Development Corporation (RIEDC; later became QDC) to USACE, and from a separate telephone interview between Mabbett and Mr. Luchka, the former QDC Engineer (Mabbett, 2013), the former interceptor trench was likely the remnant of a series of chambers constructed by the Navy in the 1950s. The chambers were constructed at different elevations and presumably separated by weirs, believed possibly to "separate product from water (probably tank bottoms) before discharging the water into the [Red Maple Swamp] further to the west". Based on this historical information, the other chambers were likely filled in prior to 1983—the date when RIPA performed their excavation in the area now referred to as the former interceptor trench.

During a site visit by USACE's ecological risk assessor in the fall of 2012, the former interceptor trench was observed to be vegetated with emergent wetland plants and contained a small area of shallow standing water. Plants noted growing in the trench included cattail, purple loosestrife, boneset, jewel weed, soft rush, sedges, and Phragmites australis. Surface water present in the depression was noted as having a distinct iron sheen. During four visits between 2011 and 2012, Mabbett observed surface water outflow from the former interceptor trench at a near "trickle" to a steady discharge; no surface water was present during site visits in the summer and fall of 2014 and 2015; a mixture of snow and ice was present in the winter of 2016. The outfall was dry during the September/October 2020 sampling event.

4.3.4 Stormwater Detection Basin

A man-made, unlined storm water detention basin (approximately 1.42 acres) is located adjacent to and west of the northwestern segment of the Blue Beach walking path (Figure 4-6). The detention basin is owned by Circuit Drive Drainage Association and operated by a consortium of the four companies that use it. The detention basin receives stormwater run-off from catch basins located at four businesses located to the northwest of the Site; the businesses include Dominion Diagnostics, Meister Abrasives, Inc., Supfina Machine Company, Inc., Emissive Energy, and Stanley Bostich. The stormwater in these catch basins is conveyed by gravity through underground conduits that discharge into the detention basin. An overflow spillway/weir is located midway along the eastern side of the detention basin. The spillway/weir reportedly drains into a conduit (dimensions not known) that discharges in the vicinity of QDC Outfall 026 (the conduit outfall has not been observed by Mabbett).

4.3.5 Surface Water Bodies

The Red Maple Swamp tidal stream is the only surface water body on Site. Narragansett Bay borders the southern boundary of the Site. There are no surface water features on the Blue Beach FUDS Project.

4.4 Geology

This section presents a discussion of regional and site geology. It is based on information from published literature and data gathered during the investigations conducted at the Site and adjacent areas.

4.4.1 Regional Geology

The Quonset Point area is located on the western flank of a glacially carved valley that forms the Western Passage of Narragansett Bay (Schafer, 1961) (Figure 4-2). Bedrock, consisting of meta-sedimentary rocks of the Pennsylvanian-age Rhode Island Formation, outcrops in the area in a series of discontinuous ridges, generally trending southward and partially covered by glacial deposits (Williams, 1964). Bedrock outcrops occur along Camp

Avenue, beginning approximately one-half mile north of Kiefer Park. The U.S. Geological Survey (USGS) groundwater map of the Wickford Quadrangle (1959) shows a bedrock ridge just west of the site, the eastern side of which slopes towards the east to depths of greater than 90 feet offshore of Quonset Point (Figure 4-7).

Bedrock is overlain by glacially derived ice-contact deposits, which consist of water-laid sands, gravels and silts deposited by streams or in lakes on top of or against thin sheets of ice. In some places these deposits include layers of till, consisting of dense, poorly sorted sands and gravels. Melting of the underlying ice resulted in collapse of these layers forming locally discontinuous sequences of sediments (Schafer, 1961).

In general, near the Narragansett Bay shoreline are localized areas of recent swamp and marsh deposits, and beach deposits. Most of the eastern portion of the Quonset Point area has undergone extensive reworking of near surface soils, especially during construction of the NAS and Quonset State Airport. Many swamps, marshes, streams, and ponds appear to have been filled and, in places, the shoreline has been extended eastward up to 1,000 feet by the placement of fill.

4.4.2 Site Geology

In general, subsurface conditions at the Site are consistent with the regional geologic sequence. The bedrock at the Site is overlain by glacial deposits. The overburden consists of a sequence of fill overlying sands that become increasingly dense and silty with depth. Layers of silt are found interbedded in the sands, and a dense, gravelly glacial till is found immediately overlying bedrock in select areas.

Initial investigations at the Project (GZA, 1993) indicated that surface soils consist of sand and silty sand and gravel fill varying in thickness from less than one foot to as much as 11 feet. The fill consists primarily of well-graded sands with up to about 40 percent fragments of metal, brick, wood, and glass, and, in some places, ash. The fill at Kiefer Park Tank Farm was initially found to be as deep as 14 feet. As discussed in Section 3.0, portions of the Project have been remediated to address environmental concerns, with some debris being removed and disposed off-site or consolidated on site.

The underlying natural soil strata generally consists of fine sand to depths of approximately 10 to 17 feet grading to a silty sand to depths of 27 to 39 feet. Typical of glacial deposits, the horizontal and vertical distribution of sands and silty sands are highly variable across the Site. The depth to silty sands is generally less in the glacial deposits overlying the bedrock ridge observed in the western portion of the Project area. Both sands and silty sands are interbedded with layers of silt. Sand sequences are generally thicker in the eastern portion of the Site. This type of upward-coarsening sequence is typical of a progradational shoreline, such as occurs along a high energy coastline, or of deltaic deposits.

In deeper borings along the eastern portion of the Project, a layer of glacial till was encountered at depths of approximately 30 feet bgs, beneath the silty fine sands. Till consisted mostly of very dense silty sands and gravel, with occasional boulders or boulder zones. Refusal was encountered in the intermediate and deep borings at depths ranging from 30 to 58 feet bgs. Some or all of the refusals at shallower depths, particularly to the southwest of the Hayward facility, may have been due to boulders or the bedrock ridge observed in the western portion of the Project area identified along. Within Red Maple Swamp, the overburden is approximately 15 to 30 feet thick; thickness increases toward the western border of Red Maple Swamp. Soil boring data from the MW-106 cluster indicate thick deposits of sand.

The stratigraphy at the Site is depicted in cross-sections provided in Figures 4-8A, 4-8B, and 4-8C. As shown on these figures, these cross-sections depict the stratigraphy extending west and south from OW-9.

Bedrock was penetrated and cored at five boring locations during the RI. Bedrock was encountered at 54 ft bgs, 49.5 to 54.5 ft bgs, 45-55 ft bgs, 32-42 ft bgs, and 55-60 ft bgs, respectively, at borings MW-19, MW-20, OW-4,

OW-3, and OW-1. Based on the cores obtained from these borings, the bedrock at the Site was observed to be fresh, to slightly weathered hard, fine-grained meta-sandstone. The rock quality designations (RQDs) for bedrock cores ranged from 66 percent to 98 percent. Fractures occurred along the bedding planes or at near vertical angles; most were filled with quartz and pyrite. In general, the bedrock appeared to have a low hydraulic conductivity relative to the overlying sediments.

The surface of the bedrock was delineated by five borings (MW-19, MW-20, OW-4, OW-3, and OW-1) and nine additional borings completed to refusal at the presumed bedrock depth. As noted in Section 3.3.4.2, a seismic survey was also performed in the western and southern portion of the Site in 2015 to evaluate the bedrock surface in these areas (Hager-Richter, 2015). Based on the survey and boring data, a ridge of bedrock appears to exist beneath the Site. The ridge is located parallel the western side of the Hayward facility, along the western boundary of the Project area (Figure 4-9). The ridge rises to an approximate elevation of -10 feet MSL. The ridge slopes downward to the east and west, with the lowest elevations of the bedrock surface at approximately -33 feet MSL on either side of the ridge. Additionally, the bedrock elevation north of the Circuit Drive also appears to be between approximately -33 and -36 feet MSL. The bedrock ridge appears to extend from the beachfront to at least the northern end of the Hayward facility.

The NRCS defines the soil at the adjacent Former Kiefer Park Project area as primarily consisting of the Udorthents-Urban land complex and Quonset gravelly sandy loam (Figure 4-10). However, much of the surface soils on the Project were reworked and graded during the initial construction of the NAS and since. As discussed above Section 3.0, initial historical investigations at the Project indicated that surface soils consisted of sand and silty sand and gravel fill, varying in thickness from less than one to as much as 11 feet. Beneath the historical fill and native materials appears to be the natural sequence of glacial deposits.

The forested portion of Red Maple Swamp consists of Quonset gravelly sandy loam; the tidal flat within Red Maple Swamp consists of Matunuck mucky peat; and the Blue Beach beachfront is defined as a beach, sandy surface.

Hydric soil is defined as soil present in Red Maple Swamp that becomes intermittently saturated during high tide; these samples were collected from the interior of Red Maple Swamp in 2019 (20 samples), 2011 (14 samples), and 1994 (2 samples). Sediment is defined generally as perpetually saturated media present in the tidal stream within Red Maple Swamp; the natural depressions and tidal creeks in the interior of Red Maple Swamp that are also generally perpetually saturated; and the Blue Beach beachfront sediments in the inter-tidal and sub-tidal areas along Narragansett Bay. Hydric soil and sediment samples were generally collected from 0 to 0.5 feet bgs or from 1-foot intervals between 0 and 2 feet bgs.

Red Maple Swamp receives surface water discharge from the QDC Outfall 025 at Circuit Drive, and at QDC outfall 026 at the head of the tidal stream. Surface flow between QDC Outfalls 025 and 026 is to the south. Within Red Maple Swamp, during an outgoing tide the surface water flow in the tidal stream is south toward Narragansett Bay. During an incoming tide, the surface water flow reverses, and Narragansett Bay surface water flows into tidal stream up to the QDC Outfall 026. Along the tidal stream flow path along the western border of Red Maple Swamp, the sediment appears to reflect this flow pattern, based on a defined channel and scouring. This scouring does not extend very far upstream of the dogleg (where the tidal stream turns to the east) or north toward QDC Outfall 026.

4.5 Hydrogeology

4.5.1 Regional

Regional groundwater flow in the area is generally toward the east and south, discharging to Narragansett Bay. The near-surface overburden aquifer is primarily in glacial deposits, with the bedrock surface acting as the lower aquifer boundary. The overburden aquifer thickness varies from zero near the western end of the Quonset Point

area to 60 or more feet near the eastern end (Johnson and Marks, 1959; Rosenshein et al., 1968). Reported hydraulic conductivities in the aquifer are generally quite high, with a transmissivity of 40,000 gpd/ft recorded in a former pumping well located near the Quonset Point Air Base control tower (Rosenshein et al., 1968). For an assumed 60-foot aquifer thickness, this rate is equivalent to a hydraulic conductivity of approximately 90 ft/day. It should, however, be noted that these aquifer values were derived from pumping wells which were developed in the more prolific portions of the aquifer. Consequently, these values may be higher than average values at the Site.

4.5.2 Site

Although variable in elevation due to seasonal and temporal effects, the water table in the Project area is generally encountered at depths ranging from 5.5 to 15 feet bgs. This depth generally coincides with the transition of the surface fill materials to natural sands. However, at some locations, particularly along the bedrock high running along the western boundary of the Project area, the water table lies just above or in the silty sands. Depths to groundwater are typically deeper within the Blue Beach Project area, in comparison to Red Maple Swamp where depth to groundwater is approximately 1.5 to 3 feet bgs during low tide, and 0 feet bgs during high tide (when Red Maple Swamp is partially flooded).

The potentiometric surface is depicted from water-level data from monitoring events in December 2011 on Figure 4-12, July 2014 on Figure 4-13, and September 2019 on Figure 4-14. As these figures indicate, the potentiometric surfaces were similar during each monitoring event, as would be expected from the synchronized water levels measurement collected at approximately the same interval in the tidal sequence (on an out-going tide). However, water levels were somewhat higher in 2011. As these data sets demonstrate, a groundwater divide is present in the western portion of the Project area, running roughly north-south. This groundwater divide coincides with the location of the bedrock high running beneath the western portion of the Project Area. The divide is more pronounced during the high-water conditions observed in 2011.

As these potentiometric surfaces indicate, groundwater flow direction is generally southerly across the Site, with a western and eastern component on either side of the Hayward facility, corresponding the location of the groundwater divide and bedrock ridge. Hydraulic gradients are variable across the Site with average horizontal hydraulic gradients of approximately 0.007. The gradient appears to be lower in the northern portion of the site (0.005), and steeper close to the southern site boundary (0.01) as groundwater approached the shoreline.

Based on the 2014 water levels depicted in Figure 4-12, the gradient on the southeastern portion of the Site is approximately 0.008. The gradient in the immediate area of monitoring well OW-09 is slightly less than 0.007. However, the gradient steepens immediately downgradient of OW-09 to approximately 0.02. The groundwater gradient subsequently dissipates as it enters the marsh area. Shallow groundwater flow appears to stagnate in the marsh although a slight gradient to the south toward Narragansett Bay is evident.

These changes in gradient are attributed to the subsurface geologic features of the Site. The saturated overburden in the area surrounding OW-9 is relatively thin and comprised of silty sand and poorly graded sand. These conditions restrict groundwater flow and require high gradients to transmit groundwater. In the swamp, extensive deposits of clean sand are present. The much higher permeability associated with such materials would not require strong gradient to transmit the limited flow coming from the northeast from the area of OW-09.

The potentiometric surfaces depicted in Figures 4-11 through 4-13 represent gradients in shallow groundwater. These gradients indicate shallow groundwater flows toward the center of the marsh from both the eastern and western borders of the marsh. However, groundwater sample data suggest Site-related constituents are present at depth along the western boundary of the Site in the vicinity of monitoring well W98-1.

Groundwater level data collected in 2014 was used to infer groundwater gradients in the deeper overburden deposits in the marsh. The water level measured on July 21, 2014 in the center of marsh at MW-106D (screened from -25 feet to -30 feet MSL) was 2.95 feet MSL. Water levels measured on the same date along the western boundary of the Marsh in monitoring wells W98-1 (screened at -20 to -25 feet MSL) and in PZ-2 (screened at -20 to -25 feet MSL) were 2.2 feet MSL and 2.38 feet MSL, respectively. Thus, there appears to be a modest gradient in the deep overburden deposit from the middle of the marsh to the western boundary of the Site. Comparison of water levels in MW-106D and M98-1 indicate a gradient in deep groundwater of 0.004 between these locations. Based on two separate 8-hour tidal studies in five wells (OW-1, OW-6, OW-7, OW-9, OW-10) on March 25 and 27, 1993 (GZA, 1993), the tidal flux was approximately 0.3 feet in the two wells (OW-6, OW-10) located within 20 feet upgradient from the seawall. The two wells (OW-7, OW-9) located farther inland, approximately 400 feet upgradient from the seawall, did not exhibit a substantial tidal impact (<0.05 feet). Monitoring well OW-1 located north of Circuit Drive also had no substantial tidal impact. Likewise, during two additional 8-hour tidal studies in five different wells (MW-10, MW-11, MW-12, MW-14, MW-16) on May 4 and 5, 1993 (GZA, 1993), the data confirmed there was no apparent tidal impact in any of the wells, including well MW-11, located approximately 650 feet upgradient from and the well closest to the shoreline. These data suggest tidal influence decreases with distance from the shoreline and are not significant at the Site.

Hydraulic conductivity testing using slug tests has been undertaken as part of several historical investigations in the Site area and adjacent Kiefer Park FUDS Project. GZA (1993) performed slug testing in eleven monitoring wells in OW-series shortly after their installation in the Blue Beach Salvage Area in 1993. The reported hydraulic conductivity values for the sand and silt deposits range from 1 to 112 feet/day ($3.5x10^{-4}$ cm/sec to $4.0x10^{-2}$ cm/sec). GZA (1994) performed slug testing in 21 wells in the MW-series shortly their installation in the Kiefer Park Tank Farm and adjacent area in 1993. The range of hydraulic conductivity reported for the 19 water table wells was 10.7 feet/day to 77.0 feet/day ($6x10^{-3}$ cm/sec to $2.7x10^{-2}$ cm/sec). However, GZA reported that the hydraulic conductivity in 11 of the 19 water-table wells ranged between 20 to 50 feet/day ($7x10^{-3}$ cm/sec to $2x10^{-2}$ cm/sec). The hydraulic conductivity for the two wells screened in the till ranged between 0.12 and 2.20 feet/day ($4.2x10^{-5}$ cm/sec to $2x10^{-4}$ cm/sec). GZA conducted hydraulic conductivity testing of 16 water-table monitoring wells in the W94 series shortly after their installation in Kiefer Park and adjacent Blue Beach areas in 1994. GZA (1997) reported that the results of the testing indicated a range of hydraulic conductivity measurements from 0.1 to 14 ft/day ($3.5x10^{-5}$ cm/sec to $5.0x10^{-3}$ cm/sec).

The hydraulic conductivity values determined for the MW-series water-table wells are clearly higher than the values determined for the W94-series of wells. The construction of the MW-series and W94-series wells is similar. This apparent inconsistency was evaluated by ENSR (2000) as a part of an evaluation of remedial technology undertaken for the Kiefer Park Tank Farm FUDS Project. ENSR observed that the hydraulic conductivity test done in the MW-series wells occurred during high water table conditions, while the test conducted during in W94-series wells was conducted during low water table conditions. ENSR observed that both set of water-table wells are screened across the transition from fine sand fill to nature silty sands. Thus, hydraulic testing during high water table conditions yielded measurements consistent with the more permeable fine sand fill and testing during low water table conditions yielded measurements consistent with the less permeable natural silty sands on Site. Therefore, the hydraulic conductivity measurements from the MW-series wells were judged to be more representative of fine sand fill materials and the measurements from W94-series wells were judged to be more representative of underlying, natural silt sands. This evaluation indicates that hydraulic conductivity measurements obtained from the OW-series well may be similarly impacted by groundwater elevation during the testing. Furthermore, when evaluating migration pathways and remedial options, the hydraulic properties of the overburden strata need to be carefully considered.

Groundwater flow rates across the Site can be estimated using an average horizontal gradient of 0.007 across the Site, average porosity of 0.30, and average hydraulic conductivity of 20 feet/day. The groundwater velocity can be calculated by substituting these parameter values into the following equation:

$$v=Ki/n,$$

where K = average hydraulic conductivity, i = the estimated flow gradient, and n = an assumed porosity.

The resulting ground water flow rate is 0.47 ft/day or 170 feet/year. However, caution is necessary when applying this flow water since it is representative of flow in the shallow fine sands at the Site. Using an equivalent gradient, flow through the less permeable silty sand may be an order of magnitude slower (e.g., 17 ft/year).

4.6 Land Use

As previously described, the Site is located within the Quonset Business Park (Figure 4-14). According to the North Kingstown Zoning Ordinance, "*The Quonset Business Park zoning district is established as a mixed-use center for economic activity, which may include residential and recreational uses. The Quonset Business Park is a performance-based development district that will focus on facilitating economic development that recognizes, is protective of, and is consistent with the overall community planning objectives of the town.*"

The Quonset Business Park, which is comprised of 3,207 acres and is the largest industrial park in Rhode Island by employment levels, consists of approximately 200 businesses and employs approximately 12,000 people (QDC, 2015). These businesses encompass a wide variety of fields, including office, research and development, manufacturing, warehouse and distribution, marine construction, and importation. The Quonset Business Park also includes a daycare facility (located 1.7 miles north/northwest of the Project), golf course, marina, ferry, airport, restaurants, public beaches, museums, and retail stores. The Quonset Airport, as well as open space and wetlands, comprise approximately 38 percent of the Quonset Business Park. The remaining 62 percent of the land is designated for development.

As previously described, land use at the Project is restricted to commercial/industrial activities by ELURs recorded on the deeds. ELURs were prepared separately under the Kiefer Park Tank Farm FUDs Project by RICC, the parcels' owner, for the Walking Path/Blue Beach beachfront lot, the Circuit Drive Public Parking Lot, and the Red Maple Swamp. The ELURs were submitted on April 16, 2018. Deed records can be found at the North Kingstown Town Clerk in Deed Books 3116 Page 285, Book 3116 Page 301, and Book 3117 Page 1, respectively. These ELURs prohibit residential use and limit activities to passive recreation at those parcels.

The five parcels located within the Project are within the "Quonset Light Industrial District" under the Quonset Land Use District plan (Figure 4-14) (QDC, 2018). To the west of the Project, the Walking Path/Blue Beach beachfront parcel is within the "Quonset Public and Recreation District," while the Red Maple Swamp parcel is within the "Quonset Open Space and Conservation District" under the Quonset Land Use District plan.

The Rhode Island Coastal Resources Management Council (CRMC) maintains jurisdiction over wetlands and coastal zone development at the Site.

4.6.1 Residential

There are no residences on the Site or at the Quonset Business Park. As previously discussed, unrestricted residential use is prohibited by ELURs recorded on the deeds for the parcels within the Project, and similar ELURs were filed in association with the Kiefer Park Tank Farm FUDS project for the walking path/Blue Beach beachfront, Circuit Drive Public Parking Lot, and for Red Maple Swamp.

Beyond the Site, the previously mentioned residential abutter to the west is the nearest residential area. This residence is located on the western border of Red Maple Swamp and is outside of the Quonset Business Park. As

a protected wetland, Red Maple Swamp is assumed to be unavailable for future residential development or use. Other residential areas are located outside of and to the west, north, and east of the Quonset Business Park.

4.6.2 Educational

There are no schools on the Site or on the Quonset Business Park. The nearest school is the Fishing Cove Elementary School, located approximately 0.8 miles west of the Site. Davisville Middle School and Forest Park Elementary School are located just over 2 miles north/northwest of the Site.

4.6.3 Recreational

The Blue Beach beachfront is a public beach located adjacent to the south/southwest border of the Project but within the boundary of the Site. Public access to Blue Beach beachfront is gained from the walking path, which originates on the southern side of Circuit Drive. The walking path/Blue Beach beachfront parcel is owned by RICC and maintained by QDC.

Other recreational areas at the Quonset Business Park include a bike path and three public beaches located on Quonset Point within 1 to 2 miles east of the Site: Calf Pasture Point, Compass Rose, and Spink's Neck Beach.

To the west of the Site is the natural saltwater inlet known as Fishing Cove, which is located within Wickford Harbor approximately 0.5 miles west of the Site.

4.7 Ecology

The regional and site ecological settings are described in this section.

4.7.1 Regional Ecology

The regional ecology is characterized as a mix of improved land (either developed or cleared) and non-improved land with forested uplands dominated by a diverse shrubby understory. Within the Quonset Business Park, developed areas are typically landscaped with grass and ornamental vegetation.

Additionally, RIDEM publishes the environmental sensitivity index (ESI) map for the marine and coastal areas of Rhode Island (Figure 4-15). The RIDEM ESI map is a compilation of information related to three main categories: shoreline habitats; sensitive biological resources; and human-use resources. The RIDEM ESI map include information on habitat and species present in the State. RIDEM has identified areas of critical habitat located near the Quonset airport, which is located approximately 0.85 miles northeast of the Site; in the upstream portion of Mill Creek, approximately 1 mile northwest of the Site; and in Mill Cove, located approximately 1 mile west of the Site (Figure 4-16).

4.7.2 Site Ecology

The RIDEM ESI and biodiversity resource maps that encompass the Site indicate no known sensitive species or area of critical habitat on the Site (Figure 4-15, 4-16). There are sensitive habitats for fish, waterfowl, and invertebrate species noted along Narragansett Bay, along the southern Site border. However, according to the RIDEM Environmental Resource Map (ERM), shellfishing is prohibited throughout the area of Narragansett Bay along the southern Site border (Figure 4-17).

The majority of wildlife that has been observed at the Site is within the Red Maple Swamp area. Wildlife observed has included white-tailed deer (Odocoileus virginianus), rabbits, rodents, amphibians, and birds (GZA, 1993; GZA, 1997; Mabbett, 2011; Mabbett, 2016). The forest and wetland resources at the Site are located within Red Maple Swamp, as depicted on the RIDEM Forest and Wetland Resources Map provided on Figure 4-18.

The dominant vegetation in the northern portion of Red Maple Swamp is a deciduous forest with a diverse shrubby understory; the central portion is dominated by Phragmites; and the southern portion is dominated by Spartina. RIDEM classifies the wetlands in Red Maple Swamp as estuarine emergent wetlands and forested deciduous

wetlands. The RIDEM Forest and Wetland Resources map indicates that the non-developed portions of the Site include wetland/marine estuarine and upland deciduous forest.

5.0 NATURE AND EXTENT OF CONTAMINATION

This section summarizes the results of characterization efforts and the current understanding of the nature and extent of Project-related constituents in environmental media at the Site. The nature and extent evaluation is based on more than ten historical investigations performed over the past 30 years, accounting for hundreds of environmental samples collected from soils, sediments, groundwater, surface water, and soil gas. These data provide a thorough understanding not only of the nature and extent of contamination at the Site, but also the source areas where contaminants may have been released.

5.1 Potential Source Areas of Contaminant Releases on the Blue Beach FUDS Project

Based on data from environmental samples analyzed during the 2011-2020 investigations and historical investigations, the principal chemicals identified at the Site include CVOCs, petroleum-related VOCs, SVOCs (PAHs), metals, and PCBs. Infrequent detections of pesticides were also present in soil and sediment at the Site. The presence of these chemicals in various media at the Site is attributed to chemical releases associated with the general waste handling activities during the time period when the Project was used as the Blue Beach Disposal Area from approximately 1941-1974.

Based on the horizontal and vertical extent of these chemicals within the Site, there appear to be at least two primary source areas present within the larger former disposal area: (1) the former PCB Removal Areas/former General Dynamics Salvage Yard/former Drum Storage Area on the eastern portion of the Project, where the majority of contaminants in soil have been removed and no longer act as a source area; and (2) the geophysical anomaly area on the western portion of the Project. Additionally, two areas at the Kiefer Park Tank Farm FUDS Project—the former tank farm area and the former interceptor trench area—appear to be the source of petroleum-related chemicals present at the Site. These source areas are described in the following section.

5.1.1 Blue Beach Disposal Area

Wastes identified during various investigations at the Blue Beach Disposal Area included salvaged aircraft, vehicle parts, machinery, construction debris, drummed materials, and other miscellaneous wastes (USAGC, 2010; GZA, 1993; GZA, 1997; Mabbett, 2011). However, there is no known documented inventory of wastes disposed of in the former Blue Beach Disposal Area. Constituents in soils may have been further dispersed due to apparent grading and earth-moving activities during operation of the former disposal area and during construction of the Hayward and Falvey facilities in circa 2003 and 2008, respectively. Transport of contaminants from the Project into Red Maple Swamp may have also occurred via wind and surface water run-off.

Within the Blue Beach Disposal Area, two primary source areas appear to be present as described in the following sections.

5.1.1.1 PCB Removal Areas/Former General Dynamics Salvage Yd/Former Drum Storage Area

The former PCB Removal Areas/former General Dynamics Salvage Yard/former Drum Storage Area is located on the eastern portion of the Project (Figures 3-1 and 3-7). Historical investigations identified concentrations of PCBs, VOCs, metals (e.g., arsenic), and benzo(a)pyrene in surface soils; and lead, selenium, cadmium, and naphthalene in groundwater in this area (ECC, 1999; ECC, 2003). Potential sources for these constituents included oiling of roads for dust control using oils containing PCBs, and from drums of transformer fluid historically stored in the eastern portion of the Project. The drums were subsequently removed in 1984, and the associated soils were removed during the PCB removal completed from 1998 to 2001 (ECC, 1999; ECC, 2003). As part of the PCB removal, contaminated soils were either transported off-site for disposal or consolidated and placed underneath the asphalt cap located at the southern end of Whitecap Drive, midway between the Hayward and Falvey facilities (Figure 3-7).

Groundwater data indicates the presence of CVOCs in the eastern portion of the Project, near the northern side of the Falvey facility. Former activities at either the Blue Beach Disposal Area and/or the former General Dynamics salvage yard appear to be the source of these CVOCs in groundwater in the eastern portion of the Project.

5.1.1.2 Geophysical Anomaly Area

The geophysical anomaly area on the western side of the Project is discussed in more detail in Sections 3.1.12 and 3.3.2. This area is presumed to be the potential source of CVOCs in this portion of the Site. Both large and small metallic and non-metallic unidentified buried objects were detected in the central eastern and central western portions of the survey area and removed for off-site disposal. Approximately 20 CY of metal and debris were removed from the geophysical anomaly area during the 2011 RI field activities.

Soil samples collected from the base of each test pit were submitted for laboratory analysis of VOCs and metals prior to backfilling (Table 3-6). Concentrations of VOCs and CVOCs were reported in these samples, with the highest concentrations detected being ethylbenzene and TCE in Test Pit 1. Other detected VOCs included 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; BTEX; naphthalene; n-propyl benzene; and *sec*-butyl benzene. However, only ethylbenzene and TCE were detected above the EPA RSLs for Resident Soil. Detected metals in soil samples included arsenic, barium, cadmium, chromium, and lead. The concentration of arsenic detected in each soil sample exceeded the EPA RSL, however arsenic levels were at or near regional background levels.

During the 2014 investigation, the geophysical anomaly area was further assessed as the source of CVOC and VOCs present in downgradient groundwater by conducting a temporary vertical groundwater profiling investigation at locations hydraulically upgradient and downgradient from the geophysical anomaly area, with a specific focus throughout Red Maple Swamp, along the western boundary of the Project, and along the Blue Beach beachfront (Figure 3-24). The 2014 groundwater profiling locations were chosen, in part, to evaluate possible additional release locations. Based on the 2014 investigation groundwater profiling results, no other source areas were identified west or south of the geophysical anomaly area, and no DNAPL was found.

A summary of the groundwater profiling analytical data is provided in Table 5-1. The geophysical anomaly area may be a contributing source of metals in downgradient groundwater, based on generally higher concentrations of dissolved metals (arsenic, barium, cadmium, chromium, lead, and selenium) in groundwater profiling transects down gradient from the geophysical anomaly area (TS-3 series) compared with the two upgradient transects (UP-1 and UP-2 series). Based on these data, the geophysical anomaly area appears to have been the primary source of CVOC and some metals in soil and groundwater to the west and south of the geophysical anomaly area.

5.1.2 Former Kiefer Park Tank Farm FUDS Project

The Former Kiefer Park Tank Farm is a part of the Kiefer Park FUDS Project (Figure 1-3). The former tank farm operated as a Navy tank farm housing six cylindrical USTs, three of which were located to the north of Circuit Drive and three of which were located to the south of Circuit Drive. The three tanks located north of Circuit Drive each contained aviation gas (avgas), while the three tanks south of Circuit Drive contained jet fuel. Each tank measured 80 feet in diameter by 13 feet deep and stored approximately 565,000 gallons of fuel. The tanks and associated underground piping were removed in 1989 and 1990. Constituents associated with the Kiefer Park Tank Farm FUDS Project are primarily associated with residual petroleum in soil and dissolved petroleum in groundwater. Groundwater from the Kiefer Park Tank Farm FUDS Project that may have migrated to the Blue Beach FUDS Project was addressed by USACE under the separate Kiefer Park Tank Farm FUDS Project through implementation of ELURs to eliminate exposure pathways with the potential to pose significant risk to human health.

5.2 Identification of Chemicals of Potential Concern (COPC)

As specified in the Sampling and Analysis Plan (SAP) for the Comprehensive RI (Mabbett, 2019), the detected chemical concentrations in samples collected during the 2011-2020 investigations and during selected historical

investigations were compared to their relevant risk-based screening levels to identify COPCs, which are chemicals that exceed one or more of the risk-based screening criteria defined in the Risk Assessment Work Plan (provided as Appendix E of the SAP) and presented in the CERCLA-compliant baseline risk assessment (Tables 3-2 and 4-4 through 4-11 in Appendix A). Groundwater within the Red Maple Swamp has a different set of potential exposure scenarios due to existing restrictions related to the status of a tidal wetland, than on-Project groundwater and is evaluated separately as there are no exposure scenarios that include contact with the groundwater within Red Maple Swamp. The sample data used for these comparisons are summarized by medium and exposure area in Tables 5-2 through 5-16, as described in the table below.

Table	Medium	Exposure Area
5-2	Soil	On-Project Blue Beach Upland Area
5-3	Soil	Off-Project Walking Path/Red Maple Swamp
5-4	Soil	Off-Site Background
5-5	Hydric Soil	Off-Project Red Maple Swamp/Tidal Marsh
5-6	Hydric Soil	Off-Site Background
5-7	Sediment	Off-Project Red Maple Swamp/Tidal Marsh
5-8	Sediment	Off-Project Upstream/Background Tidal Stream
5-9	Sediment	Off-Project Narragansett Bay/Beachfront
5-10	Sediment	Off-Site Beachfront Background
5-11	Groundwater	On-Site (including Former Keifer Park Site,)
5-12	Groundwater	Off-Project (Red Maple/Tidal Marsh, and off-Project)
5-13	Pore Water	Off-Project Red Maple Swamp/Tidal Marsh
5-14	Pore Water	Off-Project Narragansett Bay/Beachfront
5-15	Surface Water	Off-Project Red Maple Swamp/Tidal Marsh
5-16	Surface Water	Off-Project Narragansett Bay/Beachfront

The chemicals that exceeded the risk-based screening levels were further evaluated relative to known and possible source areas and in comparison, to background (represented by background samples collected from Rome Point State Park or from upstream locations for tidal stream sediments). Based on the source profiles and screening comparison results, the COPCs for the Site were identified as metals, PCBs, SVOCs, CVOCs, and VOCs. Petroleum-related chemicals found on and near the Site are attributed to releases from the Kiefer Park FUDS Project.

Individual COPCs that were determined to be present above background were carried forward in the RI; a discussion of the results follows below. Rather than presenting an extensive discussion for each parameter analyzed during investigations, this section focuses on only the nature and extent of the COPCs that contribute to potential Site-specific risks, as indicated by the CERCLA-compliant human health and ecological risk assessments (Section 7.0 and Appendix A).

Concentrations of selected pesticides in hydric soil and sediment collected in Red Maple Swamp were above ecological risk-based screening criteria. However, pesticides were detected infrequently, and at concentrations and locations that are not indicative of a specific release from a source associated with historical operations at the Project. Pesticides are attributed to the historical application of these chemicals consistent with their labeling and were not considered further in this RI.

5.2.1 Metals

Metals detected in soils (Tables 5-2 and 5-3) and identified as COPCs in the HHRA for direct contact are antimony, arsenic, cadmium, and thallium. Those that present a risk to human health from groundwater in a potential future use scenario include antimony, arsenic, barium, cadmium, chromium, cobalt, iron, lead, and manganese. In

addition to those identified in the HHRA, copper, mercury, selenium, silver and zinc were identified as being above screening levels in the initial steps of the SLERA.

Although some concentrations of metals were reported above screening levels, it is possible that a significant source of relatively low concentrations of metals is naturally occurring or anthropogenic (regional) background. A more detailed evaluation of background conditions is discussed in the risk assessments (Section 7.0, Appendix A). The other sources of heavy metals in the environment are most likely from the former use of the Site as a disposal area and other industrial and defense site uses in the surrounding area. However, areas of buried metal and discolored soils were removed during previous remedial actions, leaving no evidence of an on-going source area and no pattern of distribution that would indicate absorbed or dissolved-phase migration from a source area.

Metals were identified above screening levels in multiple locations throughout the Site. Although metals were reported above screening levels, they were usually relatively low and reasonably consistent concentrations and somewhat sporadically located on and off the Project area. No evidence of a single source area was identified, nor was evidence of a migration pathway. To illustrate this point, the chemical tag maps provided on Figures 5-1 through 5-15 show the distribution of these metals in the environmental medium and exposure area for which they were identified as a COPC. As shown on these figures, exceedances of the screening levels are either sporadic and do not appear to be associated with a single point source, or screening levels are exceeded at most locations (e.g., lead) despite relatively low and consistent concentrations, because the screening levels are low for this type of industrial former use setting.

5.2.2 PCBs

Section 3.0 describes several PCB removal excavations from both On-Property and Off-Property areas and the consolidation of PCB-impacted material under the cap on the Project (Figure 3-7). Concentrations of PCBs under the cap reportedly range from 35 to 690 mg/kg. Other materials from the PCB excavations were removed and disposed of offsite. Soils with PCBs were delineated for removal using a 10 mg/kg cleanup goal for both surface and subsurface (excavation floor and sidewalls) soils. Given that PCB containing soils were consolidated under the cap and the likelihood that PCB residual concentrations less than 10 mg/kg remain in soils, detections of PCBs in on-Project and off-Project media are not unexpected.

Note that the concentrations for total PCBs discussed in this section of this RI report and presented on the tables and figures differ from those reported in the risk assessments in Section 7.0 and Appendix A. The difference is in the handling of reporting limits for non-detect values. In this section and on the associated Tables and Figures, total PCBs are reported as the sum of detected Aroclor concentrations, with non-detects treated as zero. If the sample is reported non-detect for each Aroclor, the lowest reporting limit for any given Aroclor is reported as the non-detect value for that sample. In the risk assessment calculations, the reporting limits for the non-detect Aroclors are added to each other or to the detected values to report the total PCBs. For low concentration and non-detect values, the non-detect limits add a significant proportion to the reported value. In the risk assessments, this is an added layer of conservatism that ensures that risk-based decisions are protective of human health and the environment.

5.2.2.1 PCBs in On-Project Soils

To characterize current conditions for on-Project accessible soils (i.e., not under the cap or building), ISM sampling for PCBs was conducted in 2019. ISM samples were collected from surface and subsurface soils from three locations (Figures 5-16A and 5-16B). PCBs were detected in each of the samples and an exposure point concentration of 0.31 mg/kg was calculated for on-Project surface soil and 0.13 mg/kg for on-Project subsurface soil (Table 3-3 in Appendix A). The maximum concentration of PCBs detected in any single ISM sample was 0.37 mg/kg, indicating that the cap and other on-Project improvements (buildings, parking lots, and raised medians) are effectively containing soils with concentrations of PCBs above 1 mg/kg.

5.2.2.2 PCBs in Off-Project Soils

PCB samples were also collected from nine discrete locations along the walking path (Figure 5-16C). PCBs were detected in three discrete surface soil samples and detected concentrations (Aroclor 1260) ranged from 0.056 to 0.19 mg/kg. As discussed for other off-Project areas and matrices, it is likely that the source for PCBs in off-Project areas was the known, uncontrolled areas of PCB storage and disposal on the Project. Since the on-Project areas have been excavated and materials either removed or placed under the cap, previous source areas are now controlled and additional releases are unlikely. The concentrations in off-Project soil areas are significantly below 1 mg/kg and are not expected to pose a risk to human or ecological receptors

5.2.2.3 PCBs in Groundwater

PCBs were detected at trace levels in groundwater from two adjacent monitoring wells in 2008 (BMW-3 at 0.07 µg/L and OW-3 at 0.05 µg/L). Samples from 38 groundwater monitoring wells were collected and analyzed for PCBs during the 2019 investigation, including BMW-3 and OW-3. PCBs were not detected in any of the 2019 groundwater samples. These data further confirm that current measures on the Site are effectively containing PCBs under the cap and under other Site improvements.

5.2.2.4 PCBs in Off-Project Sediment and Hydric Soils

To evaluate the potential impacts of PCBs to the off-Project areas, samples were collected from off-Project soils, wetland (hydric) soils, sediment, surface water and pore water. Hydric soil and sediment sample results are tabulated on Tables 5-5 through 5-10 (Tables 5-6, 5-8, and 5-10 include results for background hydric soils, tidal stream sediment, and beachfront sediment, respectively) and shown on Figures 5-16D (surface hydric soil), 5-16E (subsurface hydric soil), and 5-16F (sediment).

As shown on the figures referenced above, the highest concentration of PCBs detected in off-Project hydric soil samples was from 0.58 mg/kg (SSH-301) and the highest concentration of PCBs detected in off-Project sediment samples was from SED-335 (1.3 mg/kg). The exposure point concentration for PCBs in hydric soil within Red Maple Swamp was calculated to be 1.0 mg/kg and for sediment in the Red Maple Swamp/tidal stream area was 0.44 mg/kg. PCB were detected in each beachfront sediment samples at relatively low concentrations with a maximum detection of 0.025 mg/kg from sample SED-310.

The ecological risk assessment (Section 7.2, Appendix A) evaluated the PCB data from sediment and hydric soils from Red Maple Swamp and compared the results to several sediment quality benchmarks, including assessing the potential bioavailability of PCBs using organic carbon (OC)-normalized data and comparing with benchmarks that were also derived using OC-normalized data. This evaluation is presented in Table 4-25 in Appendix A and concludes that although most (23 of 34) sediment and hydric soil samples were greater than the Buchman (2008) effects range median concentration for marine sediment of 0.18 mg/kg, most samples (27 of 34) were below the MacDonald (2002) probable effects concentration of 0.676 mg/kg and all, except one sample, were below the OC normalized Finkelstein (2017) 10% injury benchmarks. Furthermore, if the total PCB results were calculated using detected concentrations only, or a single Aroclor limit for non-detects, as is a more conventional method (based on the overlap of Aroclors in the analytical method), no samples would exceed the OC-normalized (Finkelstein) benchmarks and only one sample (SED-335, 1.3 mg/kg) would exceed the MacDonald probable effects concentration.

Although the concentrations of PCBs in sediment and hydric soils in Red Maple Swamp and along the beachfront are most likely attributable to the historical presence of PCBs on the Project, it is likely that the release(s) of PCBs are historical in nature from when the PCBs on the Project were uncontrolled or, possibly, released with fugitive dust or surface water runoff during excavation, cap construction, and re-grading of excavated areas. As would be expected from relatively small, historical releases, the concentrations were low and below most ecological

benchmarks. Since the on-Project past source areas are now under control, it is likely that concentrations in off-Project areas will continue to decrease over time as a result of naturally occurring attenuation processes.

5.2.2.5 PCBs in Off-Project Pore Water and Surface Water

PCBs were not detected in any of the five pore water or four surface water samples collected from Red Maple Swamp in 2011 (Tables 5-12 and 5-14).

5.2.3 Semi-Volatile Organic Compounds (SVOC)

PAHs are commonly found, especially in urban areas, from the use, storage, and burning of fossil fuels and are expected to be found in a former disposal area associated with machinery and heavy equipment, such as the Site. PAHs are usually found together in different proportions depending on the source(s) for the PAHs. Because benzo(a)pyrene is often detected when PAHs are detected and because it is usually considered the most toxic (lowest screening level), it is a good indicator compound to assess the nature and extent of PAHs both on the on-Project and in off-Project areas.

A detailed description of the background analysis is provided in the risk assessment in Appendix A. In general, the concentrations of PAHs detected in samples collected from both on the on-Project and off-Project area are relatively low and consistent with the multiple sources of anthropogenic background both on and around the Site.

Although technically categorized as a PAH, naphthalene is a lighter weight compound and usually is detected as both a volatile and semi-volatile compound. Because of its nature and low molecular weight, the primary concerns with naphthalene are its mobility and volatility. Naphthalene is discussed further in Section 5.2.4.2 separately from the PAHs summarized in this section.

Bis(2-ethylhexyl)phthalate was identified as a COPC in on-Project surface soils and off-Project sediment in the ecological risk assessment. It was detected in 4 of 27 on-Project surface soil samples and in 9 of 21 off-Project sediment samples (Figures 5-17A and 5-17B). Bis(2-ethylhexyl)phthalate is commonly found in association with plasticizers and is not unexpected on a known disposal site such as the Blue Beach Project. Because of its somewhat ubiquitous uses, it is also a common field and laboratory contaminant. Because of its relatively low frequency of detection and the fact that it was not found to be a source of unacceptable risk, it is not discussed further in this RI.

5.2.3.1 PAHs in On-Project and Off-Project Soils

SVOCs were detected in surface soil samples collected in 1994, 1995, and 2019. Those SVOCs identified as the COPCs in soils reported above screening levels include benzoic acid (Figure 5-18) and the PAHs benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, chrysene and pyrene.

The distribution of benzo(a)pyrene detected in on-Project surface soil samples is shown on Figure 5-19A. PAHs are commonly found, especially in urban areas, from the use, storage, and burning of fossil fuels and are expected to be found in a former disposal area associated with machinery and heavy equipment, such as the Site. PAHs are usually found together in different proportions depending on the source(s) for the PAHs. Because benzo(a)pyrene is often detected when PAHs are detected and because it is usually considered the most toxic (lowest screening level), it is a good indicator compound to assess the nature and extent of PAHs both on the Project and in off-Project areas.

As shown on Figure 5-19A, benzo(a)pyrene is somewhat ubiquitous throughout the Project area. Although detected in most samples and usually at concentrations above the conservative human health risk-based screening level of 0.11 mg/kg, the concentrations were relatively low with a maximum concentration of 0.5 mg/kg (SB-311, 0-1 foot).

5.2.3.2 PAHs in Groundwater

PAHs have a low water solubility; therefore, the concentrations detected are most likely associated with fine particulate in groundwater, similar to metals and PCBs. Several PAHs were identified as COPCs in groundwater including benzo(a)pyrene (Figure 5-19D), dibenzo(a,h)anthracene (Figure 5-20B), 1-methylnaphthalene (Figure 5-21), 2-methylnaphthalene (Figure 5-22), benzo(a)anthracene (Figure 5-23), benzo(b)fluoranthene (Figure 5-24B), and naphthalene (Table 5-11).

5.2.3.3 PAHs in Off-Project Sediment and Hydric Soils

Slightly higher concentrations were detected in the off-Project area sediment and hydric soils. PAHs were detected in most sediment and hydric soil samples. Concentrations detected in association with the Site, including Red Maple Swamp, were consistent with and, possibly, slightly lower than in the background upstream sediment samples. The highest concentration in Site sediment was detected at SED-328 (0-0.5 feet), the maximum benzo(a)pyrene concentration was 1.7 mg/kg and the highest PAH compound detected was benzo(b)fluoranthene (3.6 mg/kg, screening level = 1.1 mg/kg). In hydric soils, the highest concentrations of most PAHs were found in the sample from SSH-304, (0-1 foot). The maximum benzo(a)pyrene detection was at this location (3.0 mg/kg). The maximum PAH concentration was also at this location and was for fluoranthene at 8.2 mg/kg (screening level of 240 mg/kg). Fewer PAHs were detected and at lower concentrations in the subsurface hydric soil samples, indicating that low levels of PAHs were probably adsorbed onto particulates, transported to the wetland area via surface water runoff and are generally sequestered in the upper foot of hydric soils.

5.2.4 Volatile Organic Compounds (VOCs)

Several VOCs have been identified on the Site from multiple known and, possibly, unknown source areas. Because of their volatility, solubility, and toxicity, VOCs are of most concern in source areas, groundwater, and in soil vapor. The remedial actions conducted on the Site and on the former Kiefer Park Tank Farm have largely mitigated the different source areas and resulted in significantly lower concentrations of VOCs in groundwater and soil vapor.

Previous investigations on the Site are summarized in Section 3.0 and discuss the remediation of the former Kiefer Park Tank Farm used for the storage of avgas and jet fuel (JP-4). LNAPL was identified and remediated in association with the former Kiefer Park Tank Farm. On the former Blue Beach Disposal Area Property, soils with concentrations of PCBs greater than 50 mg/kg were either removed and disposed of on-site under the cap or disposed of off-site. Other materials excavated and disposed of from the Blue Beach Property included intact and damaged drums, unusual materials (e.g., brown fluff, white powder) and other machinery and metal objects.

Because of the various remedial actions and the relatively high potential for mobility of the VOC compounds, this RI uses data most representative of current conditions, data from the 2014 and 2019 sampling events. For the purposes of evaluating potential source areas, patterns and extents of migration, and contributions from the former Kiefer Park Tank Farm, VOC compounds were divided into two categories:

- CVOCs, including PCE, TCE, *cis*- and *trans*-1,2-DCE, and VC, that appear to originate from disposal activities on the Blue Beach Property.
- Naphthalene and other aromatic compounds (BTEX and 1,2,4-trimethylbenzene) attributed to petroleum releases from the former Kiefer Park Tank Farm.

Although other VOC compounds were identified as preliminary COPCs based on exceedances of screening levels, the compounds listed above were the more prevalent and/or more toxic (lower screening levels) and were chosen for this discussion to illustrate the fate and transport mechanisms occurring on the Site. Other compounds that are not specifically discussed are expected to have the same transport mechanisms as evidenced by similar distribution patterns, but were of less concern in the risk assessments, due to low frequency of detection or otherwise not found to be of unacceptable risk.

5.2.4.1 Chlorinated VOCs

CVOCs were detected in groundwater samples collected from Red Maple Swamp. TCE was detected most frequently in 33 of the 53 samples collected in 2014 and 2019. A degradation product of TCE, *cis*-1,2-DCE, was detected in 30 samples. PCE was detected in 18 samples and other degradation products, *trans*-1,2-DCE and VC, were each detected in five samples (although not the same five samples). Each of these compounds except for *trans*-1,2-DCE were detected above the screening levels and were carried forward in the risk assessment evaluation. Each of these compounds also has an MCL higher than the screening value.

Figures 5-26B and 5-26C (TCE), Figure 27 (*cis*-1,2-DCE), Figures 5-28A and 5-28B (VC), Figure 5-29 (PCE), Figure 5-30 (1,1,2,2-tetrachloroethane), Figure 5-31 (1,1,2-trichloroethane), Figure 5-32 (1,1-dichloroethane), and Figure 5-33 (1,2-dichloropropane) show the distribution of CVOCs in groundwater that were retained as COPCs in the human health risk assessment.

TCE was detected in 33 of the 53 groundwater samples from 2014 and 2019 and was detected above the screening level of 0.28 µg/L in 32 of those samples and was above the MCL of 5 µg/L in 14 samples. TCE was reported in four on-Property monitoring wells (MW-108S, OW-3, OW-9, and BMW-3) in 2019 with concentrations of between 1.4 µg/L (MW-108S) and 46 µg/L (OW-3). Otherwise, TCE was not detected in on-Property or upgradient wells. The highest concentrations of TCE were detected in groundwater samples collected from monitoring wells in Red Maple Swamp adjacent to the Property and downstream from QDC Outfall 026. Maximum concentrations of TCE detected were 180 µg/L (TS-3-D) and 134 µg/L (OW-3-A). Other detected concentrations above the MCL of 5 µg/L ranged up to 75 µg/L.

The compound *cis*-1,2-DCE was detected in 30 of the 53 samples collected in 2014 and 2019 (Figure 5-27). Of these, it was detected above the screening level of 3.6 µg/L in 13 samples, and was not detected above the MCL of 70 µg/L. As with TCE, the higher concentrations were detected in the samples collected from Red Maple Swamp to the west of the Property and downstream from QDC Outfall 026.

VC was detected in 5 groundwater samples collected in 2014 and 2019 (Figure 5-28A and 5-28B). Where it was detected, it was above the screening level of 0.02 µg/L and one sample (MW-106S in 2019, 7 µg/L) was above the MCL of 2 µg/L.

PCE has a screening level of 4.1 µg/L and an MCL of 5 µg/L. Although detected in 18 of the 53 groundwater samples collected in 2014 and 2019 (Figure 5-29), it was only detected above the screening level and MCL in one sample (maximum concentration = 5.8 µg/L in MW-107 in 2014). The sample collected from this well in 2019 was non-detect for PCE. Based on the relatively low concentrations and limited detections of PCE, this compound does not appear to be of significant concern for the Site.

Based on these results, and the lack of detections in upgradient wells, it appears the Site was a former source area for CVOCs. Because the on-Property concentrations are relatively low and the highest concentrations are from wells located downgradient from the property in Red Maple Swamp, it is likely that the release(s) of CVOCs were historical and from materials previously disposed of on the Property. These materials have since been excavated and removed from the Property or placed under the asphalt cap on the property. Based on the relatively consistent concentrations and the locations of those concentrations from 2014 to 2019, it appears that soil and debris removal/consolidation has effectively mitigated the source area(s) on the property and that no further releases are occurring or likely to occur. It also appears that further downgradient migration and/or attenuation of CVOCs is occurring relatively slowly with not much change from 2014 to 2019.

Previous investigations (Section 3.1.14) identified concentrations of CVOCs in soil vapor that generally corresponded to the locations of the underlying TCE and PCE groundwater plumes. Two distinct areas of TCE and PCE in soil vapor samples were observed: on the western side of the Project (near the geophysical anomaly area and where the Hayward facility was later constructed), and on the eastern side of the Project south of the former

General Dynamics salvage yard and near the PCB Removal Area. Subsequent to these investigations, the Hayward facility was constructed in 2004/2005 with a sub-slab depressurization system (SSDS) to mitigate potential vapor intrusion risk.

Indoor air as an exposure pathway was evaluated in this RI and in the risk assessment (Section 7.0, Appendix A). Potential VOC concentrations in indoor air, without the benefit of treatment (e.g., SSDS) were evaluated based on concentrations in shallow groundwater. Although not determined to cause an unacceptable risk, VC was the only CVOC identified as requiring evaluation as COPCs for soil vapor (Figure 5-28C).

5.2.4.2 Naphthalene

Naphthalene is classified as a PAH; however, it also has some volatile organic properties (it is analyzed as both a heavy volatile compound and as an SVOC (Section 5.2.3). As it is a PAH, it is often found in association with the burning of fossil fuels or associated with coal tar. It is also commonly found as a component of unused fuel product, such as gasoline and jet fuel, as are the low molecular weight SVOC PAHs 1-methylnaphthalene and 2-methylnaphthalene. The latter two substituted-naphthalenes and 1,2,4-trimethylbenzene were also detected in Site groundwater and identified as COPCs. Naphthalene is discussed in this section as a representative example of the higher molecular weight aromatic volatile compounds, probably associated with the storage and use of petroleum related products.

Naphthalene is also of concern because it was also carried through the HHRA (Section 7.0) as presenting the highest risk to the hypothetical potential future resident of the Site who would be using groundwater for showering and drinking. The risks to indoor workers from soil vapor was also evaluated in the risk assessment and found to be within the USEPA target risk range(s). However, naphthalene was identified as a preliminary COPC in the indoor air evaluation, based on the concentrations in groundwater on the Property (BB-4, 250 µg/L).

The distribution of naphthalene in groundwater from 2014 and 2019 is shown on Figure 5-34B. As shown on the figure, the naphthalene in groundwater plume appears to be originating upgradient abutting the former Kiefer Park Tank Farm (BB-4, 250 µg/L), and in the two wells (MW-12 and W94-6; 270 µg/L and 170 µg/L, respectively) along the northern boundary of the western side of the Site and upgradient along the walking path (MW-8 and MW-10; 35 µg/L and 190 µg/L, respectively). The highest concentration of naphthalene in groundwater was detected in 2014 in well TS-3-A at 780 µg/L, downgradient from QDC Outfall 026. Concentrations around this location were lower (CDW-4, 22 µg/L; WP-5, 34 µg/L) in 2019. Concentrations further downgradient were non-detect or below screening values in both the 2014 and 2019 groundwater sampling events.

Naphthalene was not detected above screening levels in soils, hydric soils, or sediment indicating that the Site is not the source for the naphthalene in groundwater. The data indicate that the plume likely originated at the former Kiefer Park Tank Farm and that concentrations in groundwater are decreasing over time and distance, indicating that source control measures were effective and that natural attenuation processes are further reducing the concentrations in the red maple swamp groundwater.

5.2.4.3 Volatile Aromatic Hydrocarbons (BTEX)

Light molecular weight aromatic VOCs benzene, ethylbenzene, toluene and xylene are similar to naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, and 1,2,4-trimethylbenzene in that they are most likely present in groundwater due to a release from the former Kiefer Park Tank Farm. Toluene was detected the most frequently in groundwater but has a relatively high screening value (MCL = 1,000 µg/L) and was not detected above the MCL in any groundwater samples, including those upgradient on and adjacent to the former Kiefer Park Tank Farm. Benzene was also not detected above its MCL of 5.0 µg/L.

The distributions of ethylbenzene and xylenes in groundwater are shown on Figures 5-43C and 5-44B, respectively. Ethylbenzene was detected above the screening level of 1.5 µg/L in eight of the wells sampled in 2014 and 2019.

Ethylbenzene was not detected above the MCL of 700 µg/L in any of the groundwater wells sampled. Xylene was detected above the screening level of 19 µg/l in three wells and was not detected above the MCL of 10,000 µg/L. As shown on Figures 5-43C and 5-44B, the highest concentrations of ethylbenzene (28 µg/L, MW-10) and xylene (130 µg/L, MW-8) tend to be on and abutting the former Kiefer Park Tank Farm and extending downgradient to COE-6 and TS-3-A west of the Blue Beach property.

Based on the distribution of concentrations of BTEX, the presence of these compounds in groundwater is attributed to the former Kiefer Park Tank Farm.

In addition to the CVOCs and naphthalene identified as requiring further evaluation for the soil vapor pathway in the risk assessment, 1,2,4-trimethylbenzene, ethylbenzene, and xylenes concentrations in shallow groundwater warranted further consideration as COPCs in indoor air.

6.0 CONTAMINANT FATE AND TRANSPORT

The source, fate and transport of COPCs are discussed in this Section.

6.1 Source Areas

Several potential source areas have been identified affecting both the on-Property and off-Property media. PCBs, metals, PAHs, and CVOCs have been identified in several on-Property areas in association with the use of the Property as a former disposal area. To the extent that they have been identified, on-Property areas have been remediated by excavation of materials and placement under a cap located on the Property, or by excavation, transportation, and off-site disposal. In addition, much of the on-Property area has been improved with buildings and parking lots, further limiting the infiltration of surface water and the potential for migration to groundwater. Most recent data discussed in Section 5.0 suggests that source control measures on the Property have been successful.

The second source area is on the Former Kiefer Park Tank Farm property to the north and upgradient of the Former Blue Beach Property and from the Red Maple Swamp. The Former Kiefer Park Tank Farm appears to be the primary source of petroleum related constituents including naphthalene; 1,2,4-trimethylbenzene; benzene; ethylbenzene; toluene; and xylene. Similar to the Former Blue Beach Property, remediation measures on the Former Kiefer Park Tank Farm have been effective in mitigating sources from this area.

6.2 Migration Pathways

Two primary migration pathways were identified for this Site:

- Surface water (precipitation) infiltration, dissolution, and leaching to groundwater, most applicable to the more soluble constituents: certain metals and VOCs
- Surface water overland flow (and possibly culverted storm drains) and transport of particulate matter with adsorbed metals, PAHs, and PCBs

In both cases, source control measures appear to have mitigated the potential for precipitation (surface water infiltration and run off) to readily come in contact with impacted materials. Therefore, both primary source areas and migration pathways have mitigated the potential for further releases and for those potential releases to further adversely impact off-Property areas.

Following mitigation of the primary sources and primary migration pathways is the potential for secondary sources to pose a migration pathway or exposure route. These secondary routes include:

- Constituents (primarily VOCs) in groundwater moving downgradient through Red Maple Swamp
- Constituents previously deposited in association with historical overland (or culverted) storm water runoff (metals, PAHs, and PCBs).

The VOC plumes follow the direction of groundwater flow, which appears to follow surface water to the tidal stream in the Red Maple Swamp

The latter constituents (metals, PAHs, and PCBs) are most likely associated with particulates sequestered in the Red Maple Swamp surface soils, hydric soils, and sediment and are most likely to be disturbed and dispersed via surface water under high flow (storm) events.

The data presented in this RI report (primarily from 2014 and 2019) indicates that the concentrations of COPCs in the secondary sources and pathways (Red Maple Swamp groundwater, soils, hydric soils, and sediment) are relatively low (concentrations do not pose a risk to human health or ecological receptors under current conditions). As current conditions do not pose an unacceptable risk, it is unlikely that, in the absence of further primary source contributions, future migration would pose an unacceptable risk.

7.0 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENTS

The baseline HHRA and ERA were conducted by AECOM, a Mabbett team subcontractor, in support of the RI for the Blue Beach Disposal Area FUDS in North Kingstown, Rhode Island to evaluate potential human health and ecological effects of exposures to chemicals in soil, hydric soil, groundwater, porewater, sediment, and surface water in the on-Project and/or adjacent off-Project areas, and to determine whether Project-related chemicals in these areas pose a potential cancer risk or noncancer hazard above target levels to human health or the environment.

The Human Health and Ecological Risk Assessment Report is included as Appendix A to this RI report. Summaries of the HHRA and ERA findings are provided separately in this section. In summary, both risk assessments concluded that risks from constituents on the Project were within or below the USEPA target risk levels. A hypothetical future residential scenario was conservatively evaluated in the HHRA to represent a UU/UE scenario for informational purposes. This assessment identified naphthalene in groundwater as a potential risk driver for the potential future resident scenario (i.e., for drinking and showering). However, residential use is not a reasonably anticipated future use of the Site. There are currently no residents located on the Site, it is not zoned for residential use, and there is an ELUR preventing unrestricted residential use of the Site parcels.

The risk assessments were updated since the previous risk assessment conducted for the combined area consisted of the Blue Beach Disposal Area and Kiefer Park by GZA in 1997. The current risk assessments were specifically focused on assessing current exposure conditions on the Blue Beach Project area and for off-Project areas that might be affected by the Project. Specifically, the risk assessments were conducted using sample data collected in 2019 and that represent current on-Project conditions and did not use data from samples collected from beneath the cap on the Site. The risk assessments also evaluated off-Project conditions in Red Maple Swamp, the walking path, and along the Narragansett Bay beachfront.

7.1 Human Health Risk Assessment

The purpose of the HHRA was to evaluate whether exposure to Project-related COPCs pose a cancer risk and/or noncancer hazard to human health above USEPA target risk levels. The evaluation included performing a quantitative estimation of potential cancer risk and noncancer hazard to current and potential future human receptors that may be exposed to Project-related chemicals in environmental media within the on-Project Blue Beach area and off-Project areas (i.e., Off-Project Red Maple Swamp/tidal stream area and off-Project Narragansett Bay and Beachfront area), as applicable. The HHRA was conducted in accordance with CERCLA risk assessment guidance and the Project-specific Risk Assessment Work Plan provided as Appendix E of the SAP (Mabbett, 2019).

To evaluate potential risks to these receptors, the risk assessment is conducted using a series of steps in accordance with USEPA guidance. These steps are summarized as follows:

- Developing the types of exposures that may be encountered on the Site.
- Calculating the dose of constituents based on exposure routes.
- Estimating the exposure point concentrations of constituents for different areas of the Site.
- Compiling published toxicity information for comparison with the estimated exposures from the Site.
- Estimating risk from the Site, expressed as a noncancer hazard quotient or index (HQ or HI) and/or excess lifetime cancer risk (ELCR).

The full details of this process and the findings from each step are also detailed in Appendix A. A brief summary as it pertains to the risks calculated for the Site is provided below.

The HHRA evaluated potentially complete exposure pathways for human receptors identified based on current and reasonable future land-use scenarios in accordance with the CSM (Section 6.0). The HHRA quantitatively evaluated exposure to surface soil, subsurface soil, groundwater (shallow and deep), sediment, surface water, and soil vapor, as applicable, for a reasonable maximum exposure (RME) scenario. Based on the current and future land use, the following human receptors were evaluated in the HHRA:

- Current/Future Construction/Utility Worker
- Current/Future Outdoor Worker
- Current/Future Trespasser (adolescent)
- Current/Future Recreational User (adult/child)
- Future Indoor Worker

A hypothetical future residential scenario was conservatively evaluated in the HHRA to represent a UU/UE scenario for informational purposes. However, this is not a reasonably anticipated future use of the Site. There are currently no residents located on the Site, it is not zoned for residential use, and there is an ELUR preventing residential use on the Project area and an agreement with the current owner and RIDEM to use a soil vapor barrier for all of the buildings on the Site. Therefore, the additional human receptor class was added for UU/UE consideration:

- Future Resident (adult/child) exposed to On-Project groundwater for UU/UE evaluation only.

The HHRA evaluated the following exposure pathways, as applicable, for each receptor:

- Exposure to soil through incidental ingestion, dermal contact, and inhalation of fugitive dust and volatiles in outdoor air.
- Exposure to shallow groundwater through incidental ingestion, dermal contact, and inhalation of volatiles in an excavation trench.
- Exposure to hydric surface soil, sediment, and surface water in the off-Project Red Maple Swamp/tidal stream area through incidental ingestion and dermal contact.
- Exposure to soil vapor in the on-Project Blue Beach area via the vapor intrusion pathway.

Groundwater underlying the Site is not used for drinking water or other potable use and there is an ELUR recorded on the deed that prohibits potable use of groundwater from the on-Project Blue Beach area. However, on-Project groundwater was evaluated for a hypothetical future potable use scenario to represent a UU/UE scenario for informational purposes and, if needed, for the Feasibility Study.

The cumulative potential ELCR and noncancer HI for each exposure scenario were evaluated in comparison to USEPA's target risk range of 10^{-6} to 10^{-4} and target HI of 1 (per target organ). For each associated exposure scenario (i.e., area/receptor/medium) with a potential risk/HI above USEPA target levels, risk drivers were selected from those COPCs significantly contributing to an individual ELCR greater than 10^{-4} or target organ HI greater than 1 (at one significant figure), specifically, COPCs with an individual ELCR > 10^{-6} or HI > 1. If chemicals were identified as driving risk(s) above USEPA target levels, the risk drivers were selected as contaminants of concern (COCs) for the associated medium/receptor/exposure scenario.

A summary of the potential ELCR and HI results for each of the receptors evaluated in the HHRA is presented in Table 3-11 of Appendix A. In summary, the conclusions of the HHRA indicate the following:

The cumulative potential ELCRs do not exceed the USEPA target ELCR range of 10^{-6} to 10^{-4} and the total potential HIs per target endpoint do not exceed the USEPA target HI of 1 for the current/future construction worker, current/future outdoor worker, current/future trespasser, and future indoor worker in the on-Project Blue Beach area; or the current/future recreational user in the off-Project Red Maple Swamp/tidal stream area. Therefore, no COCs were identified for these receptors.

The only risks calculated as being above the USEPA target limits are for the hypothetical future residential exposure scenario in which on-Project groundwater is a source of potable water (e.g., drinking water and showering/bathing). While exiting ELURs prohibit residential use and potable groundwater use on-Project, residential exposures to on-Project groundwater was evaluated for UU/UE considerations only. Cumulative potential ELCR and total potential HIs per target endpoint exceed the USEPA target ELCR of 10^{-4} and USEPA's target HI of 1, respectively, for the hypothetical future residential scenario in the on-Project Blue Beach area. The following table provides a summary of the chemicals in groundwater that would pose an unacceptable level of risk if groundwater were used as a potable water source. The identified COCs, potential ELCRs, and HIs associated with the groundwater exposure scenarios for each COC are provided in Table 3-11 of Appendix A and summarized below:

Groundwater COCs	Potential ELCR	Potential HI
Inorganics		
Iron	N/A	4
Manganese	N/A	7
SVOCs		
2-Methylnaphthalene	N/A	2
Naphthalene	2×10^{-3}	20
VOCs		
TCE	6×10^{-5}	10
Total for Exposure Scenario	**2×10^{-3}**	**40**

N/A - Not applicable.

In addition, the EPC for lead in groundwater within the on-Project Blue Beach area (19 µg/L) is greater than the USEPA SDWA action level of 15 µg/L (USEPA, 2018a). Therefore, it was also identified as a groundwater COC for the potable water for the hypothetical future resident exposure scenario in this area.

7.2 Ecological Risk Assessment

The purpose of the ecological risk assessment (ERA) was to evaluate the potential adverse environmental effects of Project-related COPCs on ecological receptors and resources at or near the Project. The USEPA guidance for ecological risk includes an 8-step process that allows for multiple "off-ramps" to exit the process, if calculations indicate that risk levels are within acceptable levels and no additional evaluation is warranted. For the Blue Beach FUDS Project, the ERA included the first tier of the ecological risk process (i.e., Steps 1 and 2) as a screening level ERA (SLERA). For those constituents and concentrations in given media that were above the initial screening levels, the COPCs were further evaluated in the next step of the ERA process (referred to as Step 3a). As discussed further below, the more detailed evaluation of the data for the Blue Beach FUDS Project found that chemical constituents on the Site do not pose an unacceptable risk to ecological receptors.

The ERA evaluated the following potentially complete exposure pathways for terrestrial receptors in the on-Project Blue Beach exposure area:

- Terrestrial Invertebrates – exposed to surface soil through ingestion and direct contact.
- Terrestrial Plants – exposed to surface soil through root uptake.
- Birds and Mammals – exposed to surface soil through incidental ingestion and to food items which may have bioaccumulated Project-related COPCs.

The following exposure pathways were evaluated for the wetland portions of the off-Project Red Maple Swamp (i.e., tidal creek and marsh complex):

- Soil Invertebrates – exposed to hydric soil through ingestion and direct contact.
- Wetland Plants – exposed to hydric soil through root uptake.
- Birds and Mammals – exposed to surface soil, hydric soil, and sediment within the off-Project Red Maple Swamp/tidal stream area through incidental ingestion and to food items which may have bioaccumulated Project-related COPCs.

The following additional exposure pathways were evaluated for the aquatic portions of the Project found in the off-Project Red Maple Swamp/tidal stream area and off-Project Narragansett Bay and Beachfront area:

- Benthic Invertebrates – exposed to sediment and porewater through ingestion and direct contact.
- Aquatic Fish and Invertebrates – exposed to surface water through ingestion and direct contact.

In the initial screening process, these exposure pathways were evaluated through the comparison of surface soil, hydric soil, sediment, surface water, and porewater analytical data to media-specific ecological screening values (ESVs) and by using conservative food web modeling to assess potential risks to avian and mammalian receptors. Consistency with site-specific background conditions was also considered as part of the evaluation process of the findings from the initial screening steps, as part of the identification of COPCs in each media and exposure area. Therefore, following the USEPA guidance, additional evaluation using more Site-specific circumstances and less conservative assumptions, was warranted.

In the more Site-specific evaluation (Step 3a), the risk estimates for those COPCs retained following the initial screening process were recalculated using less conservative and more realistic assumptions including refined EPCs, ESVs, and TRVs. The more Site-specific evaluation used the same representative species and exposure pathways as the SLERA, but with refined, central tendency exposure (CTE) assumptions to more realistically estimate the potential risk to ecological receptors from COPCs that were detected above the conservative SLERA screening values.

The Step 3a evaluation also considered the results from field efforts conducted in 2020 to provide Site-specific data on the benthic community (macroinvertebrate community sampling) in the tidal stream and to evaluate the bioavailability and toxicity of sediments. Sediment samples were analyzed for acid volatile sulfides (AVS), simultaneously extracted metals (SEM), TOC, and a laboratory sediment toxicity test was conducted on samples collected from upstream portions of the tidal stream.

Nearly all of the HQs based on the refined ESVs were less than 1 indicating no need for further evaluation for the majority of the COPCs. No COPCs in surface water and pore water were identified based on comparisons to chronic and acute ESVs, low frequency of detection (FOD), and a discussion of the uncertainties associated with the ESVs and detected concentrations.

In the food web models for the on-Project Blue Beach area and the off-Project Red Maple Swamp/tidal stream area, all of the lowest-observed adverse effect level (LOAEL)-based HQs were less than 1. No-observed adverse effect level (NOAEL)-based HQs were greater than 1 for some COPCs, primarily for insectivorous receptors, with a maximum HQ of 3.8 for lead (American Robin) in the on-Project Blue Beach area. Given the conservative nature of the food web models (small birds and mammals were assumed to obtain diet only from the exposure areas) and the lack of LOAEL-based HQs above 1, the COPC concentrations in these two exposure areas do not present an unacceptable risk of adverse effects to wildlife populations.

Total PCBs in hydric soil and sediment in the off-Project Red Maple Swamp/tidal stream area were the only COPCs retained based on refined ESV screens. PCBs were further evaluated using equilibrium partitioning-based benchmarks identified by NOAA (2016) and indicate that PCBs are not expected to pose a risk to the benthic community. A sediment quality triad evaluation identified locations where at least one element of the triad was

impacted, but the triad evaluation and supplemental correlation evaluations did not support an indication of COPC-related benthic invertebrate community impacts.

Based on the Step 3a evaluation of surface soil, surface hydric soil, surface sediment, surface water, and pore water in the on-Project Blue Beach area, the off-Project Red Maple Swamp/tidal stream area, and the off-Project Narragansett Bay and Beachfront area, no COPCs were retained and no further evaluation is warranted for plants, soil invertebrates, benthic invertebrates/shellfish, fish, aquatic invertebrates, birds, or mammals in these exposure areas. No COCs were identified as posing ecological risk or warrant further evaluation for ecological risk under CERCLA.

7.3 Groundwater Protection

While the risk assessments concluded no unacceptable risks to current and foreseeable receptors at the Site, results of groundwater classified as GA were compared to RIDEM GA groundwater criteria to ensure the protectiveness of this groundwater resource in maintaining drinking water quality. Therefore, off-Project groundwater analytical results were compared to RIDEM GA groundwater criteria (which are comprised of USEPA MCLs and state-specific standards for MTBE and naphthalene) (RIDEM, 2009) (Table 5-12). A total of 18 off-Project groundwater samples (including one field duplicate sample) were collected in 2019. Groundwater criteria exceedances were not prevalent and only observed in a handful of samples for two VOCs (TCE and VC), two PAHs (benzo(a)pyrene and naphthalene), and one metal (lead).

TCE exceeded its MCL of 5 µg/L in samples collected from two monitoring wells, MW-106S (14 µg/L) and W98-1 (13 µg/L). The sample collected from MW-106D, the deeper paired well for MW-106S, contained a trace concentration of TCE, below the MCL. In addition, VC was detected above the MCL (2 µg/L) in the same sample collected from MW-106S (7.0 µg/L). Benzo(a)pyrene was detected above its MCL of 0.2 µg/L in one monitoring well, COE-2 (0.23 µg/L). Naphthalene does not have an MCL, but RIDEM has promulgated a state-specific standard for GA groundwater aquifers. Naphthalene was detected above the state-specific criteria for GA groundwater of 20 µg/L in samples collected from CDW-4 (26 µg/L) and WP-5 (34 µg/L). Naphthalene was also detected above the GA criteria in the primary sample collected from CDW-4 at an estimated (J-flag) 26 µg/L, but the field duplicate sample did not exceed the GA criteria. Lead was detected in samples of Off-Project groundwater above its MCL. While the total lead concentration (20.3 µg/L) from CDW-3 exceeded the MCL (15 µg/L), the dissolved phase lead result was below the detection limit, indicating the lead present in that sample was associated with suspended solids with a low mobility. Both the total and dissolved lead concentrations (451 and 56.1 µg/L, respectively) in the sample collected from COE-1 exceeded the MCL. These results suggest lead is mobile in the dissolved phase in the vicinity of COE-1, which is located on the western side of Red Maple Swamp. However, these lead impacts are not conclusively from the Blue Beach FUDS site as there were no lead impacts to groundwater identified at the adjacent sampling points (PZ-1, PZ-2, and W98-1) located within 20 feet of COE-1.

Even though off-Project Red Swamp groundwater is classified as GA indicating this groundwater resource is a known or presumed to be suitable for public or private drinking water use without treatment, there are currently no drinking wells present in this area and no foreseeable future plans to add a drinking water well. However, given the GA groundwater criteria exceedances that can potentially impact this groundwater resource, remedial alternatives will be developed and evaluated for off-Project groundwater.

8.0 SUMMARY AND CONCLUSIONS

The objective of the Former Blue Beach Disposal Area FUDS Comprehensive RI was to determine the nature and extent of DoD-related contamination at the Site, to evaluate the fate and transport of that contamination, and to quantify the potential human health and ecological risks associated with residual environmental contamination through an updated risk assessment.

The Site encompasses approximately 21.5 acres of land and is comprised of the Former Blue Beach Disposal Area FUDS (Project Area) and off-Project areas including a walking path, tidal stream, Red Maple Swamp, and Blue Beach. These recreational areas are depicted on the Site map provided on Figure 1-3. The Site does not include the Former Kiefer Park Tank Farm FUDS Project though data from this site was collected and reviewed.

Historical investigations have been performed on the Site since approximately 1984 and have included soil, hydric soil, groundwater, sediment, pore water, surface water, and soil gas sampling, as well as test pitting, geophysical surveys, engineering evaluations, and risk assessments.

The investigations conducted between 2011 to 2020 were completed by USACE in four tiered phases: the first phase was conducted in October-December 2011; the second phase in July-August 2014; the third phase in August-September 2015; and the fourth phase in 2019-2020. Each investigation was performed according to USACE-approved Work Plans (Watermark, 2011; Mabbett, 2014; Mabbett, 2015; Mabbett 2019). The specific methods used, and analytical data generated during these investigations is summarized in the 2011, 2014-2015, and 2019-2020 Trip Reports (Mabbett, 2012; Mabbett, 2016; Mabbett, 2020).

Study goals for the Comprehensive RI included the following:

- Assessment of the geophysical anomaly area (2011).
- Expansion of the monitoring well network and collection of additional groundwater, sediment, surface water, pore water, hydric soil, and surface and subsurface soil samples for analysis to better assess the nature and extent of contamination identified in previous investigations and address data gaps identified in the preliminary CSM (2011).
- Refinement of the horizontal and vertical extent of CVOCs in groundwater migrating south and west from the geophysical anomaly area, which is the presumed source of CVOCs in groundwater, by conducting a vertical groundwater profiling investigation upgradient and downgradient from the source area (2014).
- Repeating the 2011 investigation sampling effort at permanent groundwater monitoring wells, pore water sample locations, and co-located sediment and surface water locations. Collect Blue Beach intertidal beachfront sediment samples for analysis for constituents potentially migrating from groundwater to sediment (2014).
- Assessment of sediment, porewater, and surface water along the Narragansett Bay beachfront area adjacent to Blue Beach for constituents that may have migrated to these media from upgradient groundwater (2015).
- Assessment of upland soil, hydric soil, sediment, and groundwater (2019-2020).
- Performance of sediment toxicity testing and an invertebrate survey for the ecological risk assessment at on-Project and off-Project locations (2019-2020).
- Conducting a background sampling program was conducted to collect a representative data set for comparison with Site data to support the human health and ecological assessments and conclusions regarding naturally occurring or anthropogenic sources not associated with the Former Blue Beach Disposal area (2019-2020).

- Conducting a human health and ecological risk assessment for the Site and screening of off-Project GA groundwater for contamination in excess of state and federal standards.

Based on the horizontal and vertical extent of these chemicals within the Site, there appear to be at least two primary source areas present within the larger former Blue Beach Disposal Area: (1) the former PCB Removal Areas/former General Dynamics Salvage Yard/former Drum Storage Area on the eastern portion of the Project, where the majority of contaminants in soil have been removed and no longer act as a source area; and (2) the geophysical anomaly area on the western portion of the Project. Additionally, two areas at the Kiefer Park Tank Farm FUDS Project—the former tank farm area and the former interceptor trench area—appear to be the source of petroleum-related chemicals present at the Site.

COPCs for the Site were identified as metals, PCBs, SVOCs, CVOCs, and VOCs. Petroleum-related chemicals detected on and near the Site are attributed to releases from the Kiefer Park FUDS Project. PCBs were detected at trace levels in groundwater from two monitoring wells in 2008 (BMW-3 at 0.07 µg/L and OW-3 at 0.05 µg/L). Samples were also collected for PCB analysis from 38 groundwater monitoring wells during the 2019 investigation and PCBs were not detected in any of the samples. These data further confirm that current measures on the Site are effectively containing PCBs under the cap and under other Site improvements. In addition, much of the on-Property area has been improved with buildings and parking lots, further limiting the infiltration of precipitation, and reducing the potential for migration of contaminants from soil to groundwater. The most recent data discussed in Section 5.0 suggests that source control measures on the Property have been successful.

The second source area is on the Former Kiefer Park Tank Farm property to the north and upgradient of the Former Blue Beach Property and from the Red Maple Swamp. The Former Kiefer Park Tank Farm appears to be the primary source of petroleum-related constituents including naphthalene; 1,2,4-trimethylbenzene; benzene; ethylbenzene; toluene; and xylene. Similar to the Former Blue Beach Property, remediation measures on the Former Kiefer Park Tank Farm have been effective in mitigating sources from this area.

The data presented in this RI report (primarily from 2014 and 2019) indicates that the concentrations of COPCs in the secondary sources and pathways (Red Maple Swamp groundwater, soils, hydric soils, and sediment) are relatively low (concentrations do not pose a risk to human health or ecological receptors under current conditions) and groundwater impacts are limited to isolated areas of lead contamination. As current conditions do not pose an unacceptable risk, it is unlikely that, in the absence of further primary source contributions, future migration would pose an unacceptable risk.

In summary, the human health and ecological risk assessments concluded that risks from constituents on the Project were within or below the USEPA target risk levels with the exception of the potential future use of on-Project groundwater for residential purposes (i.e., for drinking and showering).

The only risks calculated as being above the USEPA target limits are for the hypothetical future residential exposure scenario in which on-Project groundwater is a source of potable water (e.g., drinking water and showering/bathing). Specifically, the concentrations of naphthalene in groundwater pose an unacceptable risk to the potential future resident if that resident used groundwater from the Project as the primary source of potable water. In addition, the EPC for lead in groundwater within the on-Project Blue Beach area (19 µg/L) is greater than the USEPA SDWA action level of 15 µg/L (USEPA, 2018a). Therefore, it was also identified as a groundwater COC for the potable water for the hypothetical future resident exposure scenario in this area.

Total PCBs in hydric soil and sediment in the off-Project Red Maple Swamp/tidal stream area were the only COPCs retained based on refined ESV screens. PCBs were further evaluated using equilibrium partitioning-based benchmarks identified by NOAA (2016) and indicate that PCBs are not expected to pose a risk to the benthic community. A sediment quality triad evaluation identified locations where at least one element of the triad was

impacted, but the triad evaluation and supplemental correlation evaluations did not support an indication of COPC-related benthic invertebrate community impacts.

Based on the evaluation of surface soil, surface hydric soil, surface sediment, surface water, and pore water in the on-Project Blue Beach area, the off-Project Red Maple Swamp/tidal stream area, and the off-Project Narragansett Bay and Beachfront area, no COPCs were retained, and no further evaluation is warranted for plants, soil invertebrates, benthic invertebrates/shellfish, fish, aquatic invertebrates, birds, or mammals in these exposure areas. No COCs were identified as posing ecological risk or warrant further evaluation for ecological risk under CERCLA.

The comprehensive RI performed by USACE between approximately 2011 and 2020 concluded that the human health and ecological risks from constituents on the Project are within or below the USEPA's target risk range, with the exception of the potential future use of groundwater (i.e., drinking water and showering/bathing) under a future residential exposure scenario. This scenario is not currently reasonably anticipated as a future use of the Site and an ELUR has been implemented as part of the groundwater remedy for the Former Kiefer Park Tank Farm FUDS that prohibits the use of groundwater as a potable supply.

While the risk assessments concluded no unacceptable risks to current and foreseeable receptors at the Site, groundwater samples collected from areas classified as GA were compared to RIDEM GA groundwater criteria to ensure the protectiveness of this groundwater resource in maintaining drinking water quality. Even though off-Project Red Swamp groundwater is classified as GA, indicating this groundwater resource is a known or presumed to be suitable for public or private drinking water use without treatment, there are currently no drinking water wells present in this area and no foreseeable future plans to add a drinking water well. However, given the GA groundwater criteria exceedances (TCE, VC, benzo[a]pyrene, naphthalene, and lead) that can potentially impact this groundwater resource, remedial alternatives will be developed and evaluated for off-Project groundwater.

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TABLES

Table 3-1
Summary of Soil Vapor Analytical Results
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	EA01VP	EA04VP	EA15VP	EA20VP	EA26VP	EA27VP
				SAMPLE ID	EA01VP-031706	EA04VP-031706	EA15VP-031706	EA20VP-031706	EA26VP-031706	EA27VP-031706
				SAMPLE DATE	17-Mar-06	17-Mar-06	17-Mar-06	17-Mar-06	17-Mar-06	17-Mar-06
ANALYTE	**CAS**									
VOCs (µg/m3)		**VISL Res**	**VISL Ind**							
1,1,1-TRICHLOROETHANE	71-55-6				1.6U	1.6U	16U	16U	16U	16U
1,1,2,2-TETRACHLOROETHANE	79-34-5				2.1U	2.1U	21U	21U	21U	21U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (FREON 113)	76-13-1				2.3U	2.3U	23U	23U	23U	23U
1,1,2-TRICHLOROETHANE	79-00-5				1.6U	1.6U	16U	16U	16U	16U
1,1-DICHLOROETHANE	75-34-3	58.5	256		**2.8**	1.2U	12U	12U	12U	12U
1,1-DICHLOROETHENE	75-35-4				1.2U	1.2U	12U	12U	12U	12U
1,2,4-TRICHLOROBENZENE	120-82-1				2.2U	2.2U	22U	22U	22U	22U
1,2,4-TRIMETHYLBENZENE	95-63-6	209	876		**3.6**	1.5U	15U	15U	15U	15U
1,2-DIBROMOETHANE	106-93-4				2.3U	2.3U	23U	23U	23U	23U
1,2-DICHLOROBENZENE	95-50-1				1.8U	1.8U	18U	18U	18U	18U
1,2-DICHLOROETHANE	107-06-2				1.2U	1.2U	12U	12U	12U	12U
1,2-DICHLOROPROPANE	78-87-5				1.4U	1.4U	14U	14U	14U	14U
1,2-DICHLOROTETRAFLUOROETHANE	76-14-2				2.1U	2.1U	21U	21U	21U	21U
1,3,5-TRIMETHYLBENZENE	108-67-8				1.5U	1.5U	15U	15U	15U	15U
1,3-DICHLOROBENZENE	541-73-1				1.8U	1.8U	18U	18U	18U	18U
1,4-DICHLOROBENZENE	106-46-7				1.8U	1.8U	18U	18U	18U	18U
2-BUTANONE (MEK)	78-93-3	17400	73000		**3.7**	**4.7**	8.8U	8.8U	8.8U	**22**
2-HEXANONE	591-78-6				1.2U	1.2U	12U	12U	12U	12U
4-METHYL-2-PENTANONE	108-10-1	10400	43800		**3.8**	1.2U	12U	12U	12U	12U
ACETONE	67-64-1	107000	451000		**16**	0.7U	7.2U	7.2U	7.2U	7.2U
BENZENE	71-43-2	12	52.4		1.0U	1.0U	9.6U	9.6U	**160**	9.6U
BENZYL CHLORIDE	100-44-7				1.6U	1.6U	16U	16U	16U	16U
BROMODICHLOROMETHANE	75-27-4				2.0U	2.0U	20U	20U	20U	20U
CARBON DISULFIDE	75-15-0				0.9U	0.9U	9.4U	9.4U	9.4U	9.4U
CARBON TETRACHLORIDE	56-23-5				1.9U	1.9U	19U	19U	19U	19U
CHLOROBENZENE	108-90-7				1.4U	1.4U	14U	14U	14U	14U
CHLOROETHANE	75-00-3				0.8U	0.8U	8U	8U	8U	8U
CHLOROFORM	67-66-3				1.5U	1.5U	15U	15U	15U	15U
CHLOROMETHANE	74-87-3	313	1310		**1.2**	0.7U	7.4U	7.4U	7.4U	7.4U
CIS-1,2-DICHLOROETHENE	156-59-2	695	2920		1.2U	1.2U	12U	12U	12U	**51**
CIS-1,3-DICHLOROPROPENE	10061-01-5				1.4U	1.4U	14U	14U	14U	14U
CYCLOHEXANE	110-82-7	20900	87600		1.0U	1.0U	**66**	**430**	10U	**20**
DIBROMOCHLOROMETHANE	124-48-1				2.6U	2.6U	26U	26U	26U	26U
DICHLORODIFLUOROMETHANE	75-71-8	348	1460		1.5U	**2.5**	15U	15U	15U	15U
ETHYLBENZENE	100-41-4				1.3U	1.3U	13U	13U	13U	13U
FREON 113	76-13-1				2.3U	2.3U	23U	23U	23U	23U
HEXACHLOROBUTADIENE	87-68-3				3.2U	3.2U	32U	32U	32U	32U
HEXANE	110-54-3	2430	10200		1.1U	1.1U	11U	**490**	11U	11U
ISOPROPANOL	67-63-0				0.7U	**2.4**	7.4U	7.4U	7.4U	7.4U
METHYL BROMIDE	74-83-9				1.2U	1.2U	12U	12U	12U	12U
METHYL TERT-BUTYL ETHER	1634-04-4	360	1570		**10**	**1.7**	11U	11U	11U	11U
METHYLENE CHLORIDE	75-09-2	2090	8760		1.9U	**2.7**	19U	19U	19U	19U
N-HEPTANE	142-82-5	1390	5840		1.2U	1.2U	12U	**1400**	12U	12U
PROPENE	115-07-1				0.5U	0.5U	5.2U	5.2U	5.2U	5.2U
STYRENE	100-42-5				1.3U	1.3U	13U	13U	13U	13U
TETRACHLOROETHENE	127-18-4	139	584		**3.7**	**6.2**	20U	20U	20U	20U
TETRAHYDROFURAN	109-99-9				0.9U	0.9U	8.8U	8.8U	8.8U	8.8U
TOLUENE	108-88-3				1.1U	1.1U	11U	11U	11U	11U
TRANS-1,2-DICHLOROETHENE	156-60-5	695	2920		1.2U	1.2U	12U	12U	12U	**18**
TRANS-1,3-DICHLOROPROPENE	10061-02-6				1.4U	1.4U	14U	14U	14U	14U
TRICHLOROETHYLENE	79-01-6				1.6U	1.6U	16U	16U	16U	16U
TRICHLOROFLUOROMETHANE	75-69-4				**5.6**	1.8U	18U	18U	18U	18U
VINYL ACETATE	105-05-4	695	2920		1.1U	**2.5**	11U	11U	11U	11U
VINYL CHLORIDE	75-01-4	5.59	92.9		0.8U	0.8U	7.6U	7.6U	7.6U	**180**
XYLENE O	95-47-6				1.3U	1.3U	13U	13U	13U	13U
XYLENE P,M	179601-23-1				1.3U	1.3U	13U	13U	13U	13U

Notes:
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
Screening values are USEPA Vapor Intrusion Screening Levels (VISL) for residential and industrial scenarios. See risk assessment for details.

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Table 3-2
Former Kiefer Park Tank Farm Interceptor Trench Summary of Sediment Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION	SED 2		SED-6A	SED-102-2014			SD-04-KF	
SAMPLE ID	SED 2A 0-0.5	SED2-012512	SED-6A-120194	SED-102-A-2014	SED-102-ADUP-2014	SED-199-A-2014	SD-04-KF	SD-05-KF
SAMPLE DATE	11/30/2011	1/25/2012	12/1/1994	8/1/2014	8/1/2014	8/1/2014	7/27/1995	7/27/1995
SAMPLE DEPTH (feet)	0-0.5	0-0.5	0-0.33	0-0.5	0-0.5	0-0.5	0-2	0-2
Metals (mg/kg)								
ALUMINUM	--	--	**6770**	--	--	--	**4580**	**5170**
ANTIMONY	--	--	10.1 U	--	--	--	12.4 U	12.8 U
ARSENIC	2 U	--	16.8 U	**1.7 J**	**1.4 J**	**5.2 J**	**1.1**	**1.2**
BARIUM	**16.7**	--	**23.5**	**13.8 J**	**13.3**	**26.6 J**	**10.7**	**11.7**
BERYLLIUM	--	--	0.503 U	--	--	--	0.34 U	0.39 U
CADMIUM	0.4 U	--	**0.838**	0.5 UJ	0.3 U	**0.2 J**	0.84 UJ	0.86 UJ
CALCIUM	--	--	**863**	--	--	--	**685**	**782**
CHROMIUM	**4.4**	--	**8.21**	**4.4 J**	**4.17**	**4.4 J**	3.3 U	3.5 U
COBALT	--	--	**12.6**	--	--	--	**2.4**	**1.7 J**
COPPER	--	--	**10.7**	--	--	--	5 U	6.2 U
CYANIDE	--	--	--	--	--	--	0.1 UJ	0.1 UJ
FERRIC IRON 3+	--	--	**9740**				**4810**	**5210**
LEAD	**14.2**	--	**33.5**	**2.9 J**	**2.59 J**	**15.9 J**	**5.6**	**5.5**
MAGNESIUM	--	--	**1250**	--	--	--	**596**	**615**
MANGANESE	--	--	**741**	--	--	--	**41.1**	**51.8**
MERCURY	**0.016 J**	--	**0.482**	**0.02 J**	**0.0186 J**	**0.02 J**	0.07 UJ	0.07 UJ
NICKEL	--	--	9.05 U	--	--	--	3.8 U	4.7 U
POTASSIUM	--	--	**890**	--	--	--	286 UJ	295 U
SELENIUM	3.9 U	--	16.8 U	6.3 UJ	4.2 U	5.5 UJ	0.78 UJ	0.81 U
SILVER	0.4 U	--	3.35 U	0.5 UJ	0.3 U	0.5 UJ	1.4 U	0.88 UJ
SODIUM	--	--	**178**	--	--	--	58.1 U	85.2 U
THALLIUM	--	--	50.3 U	--	--	--	0.89 U	0.92 U
VANADIUM	--	--	**11.2**	--	--	--	**5.4**	**6.8**
ZINC	--	--	**112**	--	--	--	**23.7 J**	**26.3 J**
PCBs (µg/kg)								
AROCLOR 1016	64.3 U	--	56 U	40.8 U	--	39.6 U	42 U	41 U
AROCLOR 1221	64.3 U	--	110 U	40.8 U	--	39.6 U	85 U	83 U
AROCLOR 1232	64.3 U	--	56 U	40.8 U	--	39.6 U	42 U	41 U
AROCLOR 1242	64.3 U	--	56 U	40.8 U	--	39.6 U	42 U	41 U
AROCLOR 1248	64.3 U	--	56 U	40.8 U	--	39.6 U	42 U	41 U
AROCLOR 1254	64.3 U	--	56 U	40.8 U	--	39.6 U	42 U	41 U
AROCLOR 1260	**126**	--	**780**	**71.3**	--	**150**	**37 J**	**72 J**
AROCLOR 1262	64.3 U	--	--	40.8 U	--	39.6 U	--	--
AROCLOR 1268	64.3 U	--	--	40.8 U	--	39.6 U	--	--
Pesticides (µg/kg)								
4,4'-DDD	--	**2.4 J**	**48**	--	--	--	4.2 UJ	**4.4 J**
4,4'-DDE	--	**1.4 J**	**21**	--	--	--	4.2 U	4.1 U
4,4'-DDT	--	3.0 U	**63**	--	--	--	4.2 U	4.1 U
ALDRIN	--	3.0 U	**0.41 J**	--	--	--	2.2 U	2.1 U
ALPHA-BHC	--	3.0 U	2.8 U	--	--	--	2.2 U	2.1 U
ALPHA-CHLORDANE	--	3.0 U	**5.3**	--	--	--	2.2 U	2.1 U
BETA-BHC	--	3.0 U	2.8 U	--	--	--	2.2 U	2.1 U

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Table 3-2
Former Kiefer Park Tank Farm Interceptor Trench Summary of Sediment Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION	SED 2		SED-6A	SED-102-2014			SD-04-KF	
SAMPLE ID	SED 2A 0-0.5	SED2-012512	SED-6A-120194	SED-102-A-2014	SED-102-ADUP-2014	SED-199-A-2014	SD-04-KF	SD-05-KF
SAMPLE DATE	11/30/2011	1/25/2012	12/1/1994	8/1/2014	8/1/2014	8/1/2014	7/27/1995	7/27/1995
SAMPLE DEPTH (feet)	0-0.5	0-0.5	0-0.33	0-0.5	0-0.5	0-0.5	0-2	0-2
Pesticides (µg/kg)								
CHLORDANE	--	35.4 U	--	--	--	--	--	--
DELTA-BHC	--	3.0 U	2.8 U	--	--	--	2.2 U	2.1 U
DIELDRIN	--	3.0 U	5.6 U	--	--	--	4.2 U	4.1 U
ENDOSULFAN I	--	3.0 U	2.8 U	--	--	--	2.2 U	2.1 U
ENDOSULFAN II	--	3.0 U	**21**	--	--	--	4.2 U	4.1 U
ENDOSULFAN SULFATE	--	3.0 U	**1.4 J**	--	--	--	4.2 U	4.1 U
ENDRIN	--	3.0 U	5.6 U	--	--	--	4.2 U	4.1 U
ENDRIN ALDEHYDE	--	3.0 U	**25**	--	--	--	4.2 U	4.1 U
ENDRIN KETONE	--	**1.2 J**	5.6 U	--	--	--	4.2 U	4.1 U
GAMMA-BHC	--	1.8 U	2.8 U	--	--	--	2.2 U	2.1 U
GAMMA-CHLORDANE	--	3.0 U	**5.4**	--	--	--	2.2 U	2.1 U
HEPTACHLOR	--	3.0 U	2.8 U	--	--	--	2.2 U	2.1 U
HEPTACHLOR EPOXIDE	--	3.0 U	2.8 U	--	--	--	2.2 U	2.1 U
HEXACHLOROBENZENE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
METHOXYCHLOR	--	3.0 U	28 U	--	--	--	22 U	21 U
TOXAPHENE	--	148 U	280 U	--	--	--	220 U	210 U
Semi-Volatile Organic Compounds (µg/kg)								
1-METHYLNAPHTHALENE	--	--	**2400**	--	--	--	--	--
2-CHLORONAPHTHALENE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
2-CHLOROPHENOL	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
2-METHYLNAPHTHALENE	--	401 U	**1600**	232 U	--	230 U	**7700 J**	**13000 J**
2-METHYLPHENOL	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
2-NITROANILINE	--	401 U	2500 U	232 U	--	230 U	4200 U	4100 U
2-NITROPHENOL	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
2,2'-OXYBIS(1-CHLOROPROPANE)	--	--	--	--	--	--	1700 U	1600 U
2,4-DICHLOROPHENOL	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
2,4-DIMETHYLPHENOL	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
2,4-DINITROPHENOL	--	2010 U	5000 U	1150 U	--	1150 U	4200 U	4100 U
2,4-DINITROTOLUENE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
2,4,5-TRICHLOROPHENOL	--	401 U	500 U	232 U	--	230 U	4200 U	4100 U
2,4,6-TRICHLOROPHENOL	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
2,6-DINITROTOLUENE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
3-NITROANILINE	--	401 U	2500 U	232 U	--	230 U	4200 U	4100 U
3,3'-DICHLOROBENZIDINE	--	804 U	1000 U	232 U	--	230 U	1700 U	1600 U
3,4-METHYLPHENOL	--	804 U	500 U	462 U	--	459 U	--	--
4-BROMOPHENYL-PHENYLETHER	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
4-CHLORO-3-METHYLPHENOL	--	401 U	1000 U	232 U	--	230 U	1700 U	1600 U
4-CHLOROANILINE	--	804 U	1000 U	232 U	--	230 U	1700 U	1600 U
4-CHLOROPHENYL-PHENYLETHER	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
4-METHYLPHENOL	--				--		1700 U	1600 U
4-NITROANILINE	--	401 U	1000 U	232 U	--	230 U	4200 U	4100 U

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Table 3-2
Former Kiefer Park Tank Farm Interceptor Trench Summary of Sediment Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION	SED 2		SED-6A	SED-102-2014			SD-04-KF	
SAMPLE ID	SED 2A 0-0.5	SED2-012512	SED-6A-120194	SED-102-A-2014	SED-102-ADUP-2014	SED-199-A-2014	SD-04-KF	SD-05-KF
SAMPLE DATE	11/30/2011	1/25/2012	12/1/1994	8/1/2014	8/1/2014	8/1/2014	7/27/1995	7/27/1995
SAMPLE DEPTH (feet)	0-0.5	0-0.5	0-0.33	0-0.5	0-0.5	0-0.5	0-2	0-2
Semi-Volatile Organic Compounds (µg/kg)								
4-NITROPHENOL	--	2010 U	2500 U	1150 U	--	1150 U	4200 U	4100 UJ
4-NITROSODIPHENYLAMINE	--	--	--	--	--	--	1700 U	1600 U
ACENAPHTHENE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
ACENAPHTHYLENE	--	401 U	500 U	**105 J**	--	**123 J**	1700 U	1600 U
ANTHRACENE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
BENZO(A)ANTHRACENE	--	**72 J**	500 U	**159 J**	--	**147 J**	1700 U	1600 U
BENZO(A)PYRENE	--	**83 J**	500 U	**185 J**	--	**194 J**	1700 U	1600 U
BENZO(B)FLUORANTHENE	--	401 U	500 U	**248 J**	--	**208 J**	1700 U	1600 U
BENZO(G,H,I)PERYLENE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
BENZO(K)FLUORANTHENE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
BENZOIC ACID	--	2010 U	5000 U	2320 U	--	2300 U	--	--
BENZYL ALCOHOL	--	401 U	1000 U	232 U	--	230 U	--	--
BIS-(2-CHLOROETHOXY)-METHANE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
BIS-(2-CHLOROETHYL)-ETHER	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
BIS-(2-CHLOROISOPROPYL)-ETHER	--	401 U	500 U	232 U	--	230 U	--	--
BIS-(2-ETHYLHEXYL)-ADIPATE	--	--	500 U	--	--	--	--	--
BIS-(2-ETHYLHEXYL)-PHTHALATE	--	401 U	500 U	**202 J**	--	230 U	1700 U	1600 U
BUTYL BENZYL PHTHALATE	--	401 U	500 U	232 U	--	230 U	1700 UJ	1600 U
CARBAZOLE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
CHRYSENE	--	**74 J**	500 U	**192 J**	--	**177 J**	1700 U	1600 U
DI-N-BUTYL PHTHALATE	--	401 U	**1800**	232 U	--	230 U	1700 U	1600 U
DI-N-OCTYL PHTHALATE	--	401 U	500 U	232 U	--	230 U	1700 UJ	1600 UJ
DIBENZO(A,H)ANTHRACENE	--	201 U	500 U	115 U	--	114 U	1700 U	1600 U
DIBENZOFURAN	--	401 U	500 U	232 U	--	230 U	**120 J**	1600 U
DIETHYL PHTHALATE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
DIMETHYL PHTHALATE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
DINITRO-O-CRESOL	--	2010 U	2500 U	1150 UJ	--	1150 U	4200 U	4100 U
FLUORANTHENE	--	**95 J**	500 U	**236 J**	--	**198 J**	**140 J**	**250 J**
FLUORENE	--	401 U	500 U	232 U	--	230 U	**120 J**	**190 J**
HEXACHLOROCYCLOPENTADIENE	--	2010 U	5000 U	--	--	--	1700 U	1600 U
HEXACHLOROETHANE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
INDENO(1,2,3-CD)PYRENE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
ISOPHORONE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
N-NITROSO-DI-METHYLAMINE	--	401 U	500 U	232 UJ	--	230 U	--	--
N-NITROSO-DI-N-PROPYLAMINE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
N-NITROSO-DI-PHENYLAMINE	--	401 U	500 U	232 U	--	230 U	--	--
NITROBENZENE	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
PENTACHLOROPHENOL	--	2010 U	2500 U	1150 U	--	1150 U	4200 U	4100 U
PHENANTHRENE	--	401 U	500 U	**127 J**	--	230 U	**270 J**	**460 J**
PHENOL	--	401 U	500 U	232 U	--	230 U	1700 U	1600 U
PYRENE	--	**151 J**	500 U	**265 J**	--	**230 J**	**120 J**	**170 J**

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Table 3-2
Former Kiefer Park Tank Farm Interceptor Trench Summary of Sediment Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION	SED 2		SED-6A	SED-102-2014			SD-04-KF	
SAMPLE ID	SED 2A 0-0.5	SED2-012512	SED-6A-120194	SED-102-A-2014	SED-102-ADUP-2014	SED-199-A-2014	SD-04-KF	SD-05-KF
SAMPLE DATE	11/30/2011	1/25/2012	12/1/1994	8/1/2014	8/1/2014	8/1/2014	7/27/1995	7/27/1995
SAMPLE DEPTH (feet)	0-0.5	0-0.5	0-0.33	0-0.5	0-0.5	0-0.5	0-2	0-2
Total Petroleum Hydrocarbons (mg/kg)								
PETROLEUM HYDROCARBONS (TPH)	--	--	**2700**	**84.5**	--	**343**	--	--
Volatile Organic Compounds (µg/kg)								
1,1-DICHLOROETHANE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
1,1-DICHLOROETHENE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
1,1-DICHLOROPROPENE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
1,1,1-TRICHLOROETHANE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
1,1,1,2-TETRACHLOROETHANE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
1,1,2-TRICHLOROETHANE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
1,1,2,2-TETRACHLOROETHANE	3.8 U	--	--	1.4 U	--	1.2 U	1500 U	1500 U
1,2-DIBROMO-3-CHLOROPROPANE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
1,2-DIBROMOETHANE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
1,2-DICHLORETHENE	--	--	--	--	--	--	1500 U	1500 U
1,2-DICHLOROBENZENE	3.8 U	401 U	500 U	232 U	--	230 U	1700 U	1600 U
1,2-DICHLOROETHANE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
1,2-DICHLOROPROPANE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
1,2,3-TRICHLOROBENZENE	3.8 U	--	--	2.8 UJ	--	2.5 U	--	--
1,2,3-TRICHLOROPROPANE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
1,2,4-TRICHLOROBENZENE	3.8 U	401 U	500 U	232 U	--	230 U	1700 U	1600 U
1,2,4-TRIMETHYLBENZENE	3.8 U			2.8 U	--	**1.8 J**	--	--
1,3-DICHLOROBENZENE	3.8 U	401 U	500 U	232 U	--	230 U	1700 U	1600 U
1,3-DICHLOROPROPANE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
1,3,5-TRIMETHYLBENZENE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
1,4-DICHLOROBENZENE	3.8 U	401 U	500 U	232 U	--	230 U	1700 U	1600 U
2-BUTANONE (MEK)	**6.0 J**	--	--	6.9 U	--	6.2 U	1500 U	1500 U
2-CHLOROTOLUENE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
2-HEXANONE	37.8 U	--	--	6.9 U	--	6.2 U	1500 U	1500 U
2,2-DICHLOROPROPANE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
4-CHLOROTOLUENE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
4-ISOPROPYLTOLUENE	3.8 U	--	--	2.8 UJ	--	2.5 U	--	--
4-METHYL-2-PENTANONE	37.8 U	--	--	6.9 U	--	6.2 U	1500 U	1500 U
ACETONE	37.8 U	--	--	34.7 UJ	--	31 U	1500 U	1500 U
BENZENE	**1.4 J**	--	--	2.8 U	--	2.5 U	1500 U	1500 U
BROMOBENZENE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
BROMOCHLOROMETHANE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
BROMODICHLOROMETHANE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
BROMOFORM	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
CARBON DISULFIDE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
CARBON TETRACHLORIDE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
CHLOROBENZENE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
CHLOROETHANE	7.6 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
CHLOROFORM	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U

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Table 3-2
Former Kiefer Park Tank Farm Interceptor Trench Summary of Sediment Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION	SED 2		SED-6A	SED-102-2014			SD-04-KF	
SAMPLE ID	SED 2A 0-0.5	SED2-012512	SED-6A-120194	SED-102-A-2014	SED-102-ADUP-2014	SED-199-A-2014	SD-04-KF	SD-05-KF
SAMPLE DATE	11/30/2011	1/25/2012	12/1/1994	8/1/2014	8/1/2014	8/1/2014	7/27/1995	7/27/1995
SAMPLE DEPTH (feet)	0-0.5	0-0.5	0-0.33	0-0.5	0-0.5	0-0.5	0-2	0-2
Volatile Organic Compounds (µg/kg)								
CHLOROMETHANE	7.6 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
CIS-1,2-DICHLOROETHENE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
CIS-1,3-DICHLOROPROPENE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
DIBROMOCHLOROMETHANE	3.8 U	--	--	1.4 U	--	1.2 U	1500 U	1500 U
DIBROMOMETHANE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
DICHLORODIFLUOROMETHANE	7.6 U	--	--	2.8 U	--	2.5 U	--	--
ETHYLBENZENE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
HEXACHLOROBUTADIENE	3.8 U	401 U	500 U	232 U	--	230 U	1700 U	1600 U
ISOPROPYLBENZENE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
METHYL BROMIDE	7.6 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
METHYL TERT-BUTYL ETHER	3.8 U	--	--	2.8 U	--	2.5 U	--	--
METHYLENE CHLORIDE	18.9 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
N-BUTYL BENZENE	3.8 U	--	--	2.8 UJ	--	2.5 U	--	--
N-PROPYL BENZENE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
NAPHTHALENE	3.8 U	401 U	**1,100**	232 U	--	230 U	**3600**	**5900**
SEC-BUTYL BENZENE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
STYRENE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
TERT-BUTYLBENZENE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
TETRACHLOROETHENE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
TOLUENE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
TRANS-1,2-DICHLOROETHENE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
TRANS-1,3-DICHLOROPROPENE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
TRICHLOROETHYLENE	3.8 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
TRICHLOROFLUOROMETHANE	3.8 U	--	--	2.8 U	--	2.5 U	--	--
VINYL CHLORIDE	7.6 U	--	--	2.8 U	--	2.5 U	1500 U	1500 U
XYLENE O	3.8 U	--	--	2.8 U	--	2.5 U	--	--
XYLENE P,M	7.6 U	--	--	5.5 U	--	5.0 U	--	--
XYLENES, TOTAL	--	--	--	--	--	--	**1500 J**	**1400 J**

Notes:
1. -- = Sample not analyzed for this parameter
2. U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
3. J = Estimated value
4. UJ = Not detected (reporting limit approximate)
5. Bold = Detected

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Table 3-3
Former Kiefer Park Tank Farm Interceptor Trench Summary of Surface Water Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION	SW-1			SW-2		SW-2A		
SAMPLE ID	SW-1 03-13-1986	SW-1-120694	SW-7-120694	SW-2 03-13-1986	SW-2-120694	SW2-A-013012	SW-2A - 11-30-2011	SW-2AF - 11-30-2011
SAMPLE DATE	3/13/1986	12/6/1994	12/6/1994	3/13/1986	12/6/1994	1/30/2012	11/30/2011	11/30/2011
Dissolved Metals (µg/L)								
ARSENIC	--	--	--	--	--	--	--	2.5 U
BARIUM	--	--	--	--	--	--	--	**186**
CADMIUM	--	--	--	--	--	--	--	**0.33**
CHROMIUM	--	--	--	--	--	--	--	**2.2 J**
LEAD	--	--	--	--	--	--	--	2.5 U
MERCURY	--	--	--	--	--	--	--	0.2 U
SELENIUM	--	--	--	--	--	--	--	5 U
SILVER	--	--	--	--	--	--	--	0.25 U
Total Metals (µg/L)								
ALUMINUM	--	**182**	**239**	--	100 U	--		--
ANTIMONY	10 U	5 U	5 U	10 U	5 U	--		--
ARSENIC	10 U	5 U	5 U	10 U	5 U	--	**0.8 J**	--
BARIUM	--	**27**	**17**	--	3 U	--	**210**	--
BERYLLIUM	2 U	3 U	3 U	2 U	3 U	--	--	--
CADMIUM	**0.88**	4 U	4 U	0.5 U	4 U	--	**0.68**	--
CALCIUM	--	**16600**	200 U	--	**8320**	--	--	--
CHROMIUM	5 U	5 U	5 U	5 U	5 U	--	10 U	--
COBALT	--	55 U	55 U	--	55 U	--	--	--
COPPER	**7.8**	**21**	20 U	5 U	20 U	--	--	--
FERRIC IRON 3+	--	**2980**	**3540**	--	**321**	--	--	--
LEAD	10 U	**5**	**3**	10 U	**3**	--	**5**	--
MAGNESIUM	--	**1885**	**410**	--	**1060**	--	--	--
MANGANESE	--	**377**	3 U	--	**20**	--	--	--
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--	0.2 U	--
NICKEL	10 U	54 U	54 U	10 U	54 U	--	--	--
POTASSIUM	--	**1840**	1000 U	--	**2790**	--	--	--
SELENIUM	10 U	5 U	**12**	10 U	5 U	--	5 U	--
SILVER	--	20 U	**27**	--	20 U	--	0.25 U	--
SODIUM	--	**5720**	**8230**	--	**5380**	--	--	--
THALLIUM	10 U	5 U	5 U	10 U	5 U	--	--	--
VANADIUM	--	40 U	40 U	--	40 U	--	--	--
ZINC	**49**	**397**	**399**	**120**	**35**	--	--	--
Dissolved PCBs (µg/L)								
AROCLOR 1016	--	--	--	--	--	--	--	0.11 U
AROCLOR 1221	--	--	--	--	--	--	--	0.11 U
AROCLOR 1232	--	--	--	--	--	--	--	0.11 U
AROCLOR 1242	--	--	--	--	--	--	--	0.11 U
AROCLOR 1248	--	--	--	--	--	--	--	0.11 U
AROCLOR 1254	--	--	--	--	--	--	--	0.11 U
AROCLOR 1260	--	--	--	--	--	--	--	0.11 U
AROCLOR 1262	--	--	--	--	--	--	--	0.11 U
AROCLOR 1268	--	--	--	--	--	--	--	0.11 U

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Table 3-3
Former Kiefer Park Tank Farm Interceptor Trench Summary of Surface Water Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION	SW-1			SW-2		SW-2A		
SAMPLE ID	SW-1 03-13-1986	SW-1-120694	SW-7-120694	SW-2 03-13-1986	SW-2-120694	SW2-A-013012	SW-2A - 11-30-2011	SW-2AF - 11-30-2011
SAMPLE DATE	3/13/1986	12/6/1994	12/6/1994	3/13/1986	12/6/1994	1/30/2012	11/30/2011	11/30/2011
Total PCBs (µg/L)								
AROCLOR 1016	--	--	--	--		--	0.11 U	--
AROCLOR 1221	--	0.2 U	0.2 U	--	0.2 U	--	0.11 U	--
AROCLOR 1232	--	0.2 U	0.2 U	--	0.2 U	--	0.11 U	--
AROCLOR 1242	--	0.2 U	0.2 U	--	0.2 U	--	0.11 U	--
AROCLOR 1248	--	0.2 U	0.2 U	--	0.2 U	--	0.11 U	--
AROCLOR 1254	--	0.2 U	0.2 U	--	0.2 U	--	0.11 U	--
AROCLOR 1260	--	0.2 U	0.2 U	--	0.2 U	--	0.11 U	--
AROCLOR 1262	--	0.2 U	0.2 U	--	0.2 U	--	0.11 U	--
AROCLOR 1268	--	--	--	--	--	--	0.11 U	--
Pesticides (µg/L)								
4,4'-DDD	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
4,4'-DDE	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
4,4'-DDT	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
ALDRIN	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
ALPHA-BHC	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
ALPHA-CHLORDANE	--	--	--	--	--	0.053 U	--	--
BETA-BHC	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
CHLORDANE	--	0.2 U	0.2 U	--	0.2 U	0.526 U	--	--
DELTA-BHC	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
DIELDRIN	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
ENDOSULFAN I	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
ENDOSULFAN II	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
ENDOSULFAN SULFATE	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
ENDRIN	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
ENDRIN ALDEHYDE	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
ENDRIN KETONE	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
GAMMA-BHC	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
GAMMA-CHLORDANE	--	--	--	--	--	0.053 U	--	--
HEPTACHLOR	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
HEPTACHLOR EPOXIDE	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
HEXACHLOROBENZENE	--	10 U	10 U	--	10 U	10.8 U	--	--
METHOXYCHLOR	--	0.02 U	0.02 U	--	0.02 U	0.053 U	--	--
TOXAPHENE	--	0.2 U	0.2 U	--	0.2 U	1.37 U	--	--
Semi-Volatile Organic Compounds (µg/L)								
1-METHYLNAPHTHALENE	--	10 U	10 U	--	10 U	--	--	--
1,1-BIPHENYL	--	--	--	--	--	10.8 U	--	--
2-CHLORONAPHTHALENE	--	10 U	10 U	--	10 U	10.8 U	--	--
2-CHLOROPHENOL	--	10 U	10 U	--	10 U	10.8 U	--	--
2-METHYLNAPHTHALENE	--	10 U	10 U	--	10 U	10.8 U	--	--
2-METHYLPHENOL	--	10 U	10 U	--	10 U	10.8 U	--	--
2-NITROANILINE	--	50 U	50 U	--	50 U	10.8 U	--	--
2-NITROPHENOL	--	10 U	10 U	--	10 U	10.8 U	--	--
2,3,4,6-TETRACHLOROPHENOL	--	--	--	--	--	53.8 U	--	--

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Table 3-3
Former Kiefer Park Tank Farm Interceptor Trench Summary of Surface Water Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION	SW-1			SW-2		SW-2A		
SAMPLE ID	SW-1 03-13-1986	SW-1-120694	SW-7-120694	SW-2 03-13-1986	SW-2-120694	SW2-A-013012	SW-2A - 11-30-2011	SW-2AF - 11-30-2011
SAMPLE DATE	3/13/1986	12/6/1994	12/6/1994	3/13/1986	12/6/1994	1/30/2012	11/30/2011	11/30/2011
Semi-Volatile Organic Compounds (µg/L)								
2,4-DICHLOROPHENOL	--	10 U	10 U	--	10 U	10.8 U	--	--
2,4-DIMETHYLPHENOL	--	10 U	10 U	--	10 U	53.8 U	--	--
2,4-DINITROPHENOL	--	100 U	100 U	--	100 U	53.8 U	--	--
2,4-DINITROTOLUENE	--	10 U	10 U	--	10 U	10.8 U	--	--
2,4,5-TRICHLOROPHENOL	--	10 U	10 U	--	10 U	10.8 U	--	--
2,4,6-TRICHLOROPHENOL	--	10 U	10 U	--	10 U	10.8 U	--	--
2,6-DINITROTOLUENE	--	10 U	10 U	--	10 U	10.8 U	--	--
3-NITROANILINE	--	50 U	50 U	--	50 U	10.8 U	--	--
3,3'-DICHLOROBENZIDINE	--	20 U	20 U	--	20 U	21.5 U	--	--
3,4-METHYLPHENOL	--	10 U	10 U	--	10 U	21.5 U	--	--
4-BROMOPHENYL-PHENYLETHER	--	10 U	10 U	--	10 U	10.8 U	--	--
4-CHLORO-3-METHYLPHENOL	--	20 U	20 U	--	20 U	10.8 U	--	--
4-CHLOROANILINE	--	20 U	20 U	--	20 U	21.5 U	--	--
4-CHLOROPHENYL-PHENYLETHER	--	10 U	10 U	--	10 U	10.8 U	--	--
4-NITROANILINE	--	20 U	20 U	--	20 U	10.8 U	--	--
4-NITROPHENOL	--	50 U	50 U	--	50 U	53.8 U	--	--
ACENAPHTHENE	--	10 U	10 U	--	10 U	10.8 U	--	--
ACENAPHTHYLENE	--	10 U	10 U	--	10 U	10.8 U	--	--
ACETOPHENONE	--	--	--	--	--	10.8 U	--	--
ANILINE	--	--	--	--	--	10.8 U	--	--
ANTHRACENE	--	10 U	10 U	--	10 U	10.8 U	--	--
AZOBENZENE	--	--	--	--	--	21.5 U	--	--
BENZO(A)ANTHRACENE	--	10 U	10 U	--	10 U	10.8 U	--	--
BENZO(A)PYRENE	--	10 U	10 U	--	10 U	10.8 U	--	--
BENZO(B)FLUORANTHENE	--	10 U	10 U	--	10 U	10.8 U	--	--
BENZO(G,H,I)PERYLENE	--	10 U	10 U	--	10 U	10.8 U	--	--
BENZO(K)FLUORANTHENE	--	10 U	10 U	--	10 U	10.8 U	--	--
BENZOIC ACID	--	100 U	100 U	--	100 U	108 U	--	--
BENZYL ALCOHOL	--	20 U	20 U	--	20 U	10.8 U	--	--
BIS-(2-CHLOROETHOXY)-METHANE	--	10 U	10 U	--	10 U	10.8 U	--	--
BIS-(2-CHLOROETHYL)-ETHER	--	10 U	10 U	--	10 U	10.8 U	--	--
BIS-(2-CHLOROISOPROPYL)-ETHER	--	10 U	10 U	--	10 U	10.8 U	--	--
BIS-(2-ETHYLHEXYL)-ADIPATE	--	10 U	10 U	--	10 U	--	--	--
BIS-(2-ETHYLHEXYL)-PHTHALATE	--	10 U	10 U	--	10 U	6.5 U	--	--
BUTYL BENZYL PHTHALATE	--	10 U	10 U	--	10 U	10.8 U	--	--
CARBAZOLE	--	10 U	10 U	--	10 U	10.8 U	--	--
CHRYSENE	--	10 U	10 U	--	10 U	10.8 U	--	--
DI-N-BUTYL PHTHALATE	--	**140**	**160**	--	15 U	10.8 U	--	--
DI-N-OCTYL PHTHALATE	--	10 U	10 U	--	10 U	10.8 U	--	--
DIBENZO(A,H)ANTHRACENE	--	10 U	10 U	--	10 U	10.8 U	--	--
DIBENZOFURAN	--	10 U	10 U	--	10 U	10.8 U	--	--
DIETHYL PHTHALATE	--	10 U	10 U	--	10 U	10.8 U	--	--
DIMETHYL PHTHALATE	--	10 U	10 U	--	10 U	10.8 U	--	--

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Table 3-3
Former Kiefer Park Tank Farm Interceptor Trench Summary of Surface Water Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION	SW-1			SW-2		SW-2A		
SAMPLE ID	SW-1 03-13-1986	SW-1-120694	SW-7-120694	SW-2 03-13-1986	SW-2-120694	SW2-A-013012	SW-2A - 11-30-2011	SW-2AF - 11-30-2011
SAMPLE DATE	3/13/1986	12/6/1994	12/6/1994	3/13/1986	12/6/1994	1/30/2012	11/30/2011	11/30/2011
Semi-Volatile Organic Compounds (µg/L)								
DINITRO-O-CRESOL	--	50 U	50 U	--	50 U	53.8 U	--	--
FLUORANTHENE	--	10 U	10 U	--	10 U	10.8 U	--	--
FLUORENE	--	10 U	10 U	--	10 U	10.8 U	--	--
HEXACHLOROCYCLOPENTADIENE	--	100 U	100 U	--	100 U	26.9 U	--	--
HEXACHLOROETHANE	--	10 U	10 U	--	10 U	5.4 U	--	--
INDENO(1,2,3-CD)PYRENE	--	10 U	10 U	--	10 U	10.8 U	--	--
ISOPHORONE	--	10 U	10 U	--	10 U	10.8 U	--	--
N-NITROSO-DI-METHYLAMINE	--	10 U	10 U	--	10 U	10.8 U	--	--
N-NITROSO-DI-N-PROPYLAMINE	--	10 U	10 U	--	10 U	10.8 U	--	--
N-NITROSO-DI-PHENYLAMINE	--	10 U	10 U	--	10 U	10.8 U	--	--
NITROBENZENE	--	10 U	10 U	--	10 U	10.8 U	--	--
PENTACHLOROPHENOL	--	50 U	50 U	--	50 U	53.8 U	--	--
PHENANTHRENE	--	10 U	10 U	--	10 U	10.8 U	--	--
PHENOL	--	10 U	10 U	--	10 U	10.8 U	--	--
PYRENE	--	10 U	10 U	--	10 U	10.8 U	--	--
PYRIDINE	--	--	--	--	--	108 U	--	--
Total Petroleum Hydrocarbons (mg/L)								
TPH	1 U	0.01 U	**0.16**	1 U	--	--	--	--
Volatile Organic Compounds (µg/L)								
1,1-DICHLOROETHANE	--	5 U	5 U	--	5 U	--	1 U	--
1,1-DICHLOROETHENE	--	5 U	5 U	--	5 U	--	1 U	--
1,1-DICHLOROPROPENE	--	--	--	--	--	--	2 U	--
1,1,1-TRICHLOROETHANE	--	5 U	5 U	--	5 U	--	1 U	--
1,1,1,2-TETRACHLOROETHANE	--			--		--	1 U	--
1,1,2-TRICHLOROETHANE	--	5 U	5 U	--	5 U	--	1 U	--
1,1,2,2-TETRACHLOROETHANE	--	5 U	5 U	--	5 U	--	0.5 U	--
1,2-DIBROMO-3-CHLOROPROPANE	--	--	--	--	--	--	5 U	--
1,2-DIBROMOETHANE	--	--	--	--	--	--	1 U	--
1,2-DICHLOROBENZENE	--	5 U	5 U	--	5 U	10.8 U	1 U	--
1,2-DICHLOROETHANE	--	5 U	5 U	--	5 U	--	1 U	--
1,2-DICHLOROPROPANE	--	5 U	5 U	--	5 U	--	1 U	--
1,2,3-TRICHLOROBENZENE	--	--	--	--	--	--	1 U	--
1,2,3-TRICHLOROPROPANE	--	--	--	--	--	--	1 U	--
1,2,4-TRICHLOROBENZENE	--	10 U	10 U	--	10 U	10.8 U	1 U	--
1,2,4-TRIMETHYLBENZENE	--	--	--	--	--	--	**16.1**	--
1,3-DICHLOROBENZENE	--	5 U	5 U	--	5 U	10.8 U	1 U	--
1,3-DICHLOROPROPANE	--	--	--	--	--	--	1 U	--
1,3,5-TRIMETHYLBENZENE	--	--	--	--	--	--	**2.9**	--
1,4-DICHLOROBENZENE	--	5 U	5 U	--	5 U	10.8 U	1 U	--
2-BUTANONE (MEK)	--	5 U	5 U	--	5 U	--	10 U	--
2-CHLOROETHYLVINYL ETHER	--	5 U	5 U	--	5 U	--	--	--
2-CHLOROTOLUENE	--	--	--	--	--	--	1 U	--
2-HEXANONE	--	5 U	5 U	--	5 U		10 U	--

Table 3-3
Former Kiefer Park Tank Farm Interceptor Trench Summary of Surface Water Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION	SW-1			SW-2		SW-2A		
SAMPLE ID	SW-1 03-13-1986	SW-1-120694	SW-7-120694	SW-2 03-13-1986	SW-2-120694	SW2-A-013012	SW-2A - 11-30-2011	SW-2AF - 11-30-2011
SAMPLE DATE	3/13/1986	12/6/1994	12/6/1994	3/13/1986	12/6/1994	1/30/2012	11/30/2011	11/30/2011
Volatile Organic Compounds (µg/L)								
2,2-DICHLOROPROPANE	--	--	--	--	--	--	1 U	--
4-CHLOROTOLUENE	--	--	--	--	--	--	1 U	--
4-ISOPROPYLTOLUENE	--	--	--	--	--	--	**0.4 J**	--
4-METHYL-2-PENTANONE	--	5 U	5 U	--	5 U	--	10 U	--
ACETONE	--	50 U	50 U	--	50 U	--	10 U	--
ACROLEIN	--	50 U	50 U	--	50 U	--		--
ACRYLONITRILE	--	50 U	50 U	--	50 U	--		--
BENZENE	--	5 U	5 U	--	5 U	--	1 U	--
BROMOBENZENE	--	--	--	--	--	--	2 U	--
BROMOCHLOROMETHANE	--	--	--	--	--	--	1 U	--
BROMODICHLOROMETHANE	--	5 U	5 U	--	5 U	--	0.6 U	--
BROMOFORM	--	5 U	5 U	--	5 U	--	1 U	--
CARBON DISULFIDE	--	10 U	10 U	--	10 U	--	1 U	--
CARBON TETRACHLORIDE	--	5 U	5 U	--	5 U	--	1 U	--
CHLOROBENZENE	--	5 U	5 U	--	5 U	--	1 U	--
CHLOROETHANE	--	10 U	10 U	--	10 U	--	2 U	--
CHLOROFORM	--	5 U	5 U	--	5 U	--	1 U	--
CHLOROMETHANE	--	10 U	10 U	--	10 U	--	2 U	--
CIS-1,2-DICHLOROETHENE	--	5 U	5 U	--	5 U	--	1 U	--
CIS-1,3-DICHLOROPROPENE	--	5 U	5 U	--	5 U	--	0.4 U	--
DIBROMOCHLOROMETHANE	--	5 U	5 U	--	5 U	--	1 U	--
DIBROMOMETHANE	--	--	--	--	--	--	1 U	--
DICHLORODIFLUOROMETHANE	--	10 U	10 U	--	10 U	--	2 U	--
ETHYLBENZENE	--	5 U	5 U	--	5 U	--	**0.3 J**	--
HEXACHLOROBUTADIENE	--	10 U	10 U	--	10 U	10.8 U	0.6 U	--
ISOPROPYLBENZENE	--	--	--	--	--	--	**1.1**	--
METHYL BROMIDE	--	10 U	10 U	--	10 U	--	2 U	--
METHYL TERT-BUTYL ETHER	--	10 U	10 U	--	10 U	--	1 U	--
METHYLENE CHLORIDE	--	5 U	5 U	--	5 U	--	2 U	--
N-BUTYL BENZENE	--	--	--	--	--	--	1 U	--
N-PROPYL BENZENE	--	--	--	--	--	--	**1.1**	--
NAPHTHALENE	--	10 U	10 U	--	10 U	**15.4**	**13.9**	--
SEC-BUTYL BENZENE	--			--		--	**0.4 J**	--
STYRENE	--	5 U	5 U	--	5 U	--	1 U	--
TERT-BUTYLBENZENE	--			--		--	**0.3 J**	--
TETRACHLOROETHENE	--	5 U	5 U	--	5 U	--	1 U	--
TOLUENE	--	5 U	5 U	--	5 U	--	**1.5**	--
TRANS-1,2-DICHLOROETHENE	--	5 U	5 U	--	5 U	--	1 U	--
TRANS-1,3-DICHLOROPROPENE	--	5 U	5 U	--	5 U	--	0.4 U	--
TRICHLOROETHYLENE	--	5 U	5 U	--	5 U	--	1 U	--
TRICHLOROFLUOROMETHANE	--	20 U	20 U	--	20 U	--	1 U	--
VINYL ACETATE	--	10 U	10 U	--	10 U	--		--
VINYL CHLORIDE	--	10 U	10 U	--	10 U	--	1 U	--

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Table 3-3
Former Kiefer Park Tank Farm Interceptor Trench Summary of Surface Water Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION	SW-1			SW-2		SW-2A		
SAMPLE ID	SW-1 03-13-1986	SW-1-120694	SW-7-120694	SW-2 03-13-1986	SW-2-120694	SW2-A-013012	SW-2A - 11-30-2011	SW-2AF - 11-30-2011
SAMPLE DATE	3/13/1986	12/6/1994	12/6/1994	3/13/1986	12/6/1994	1/30/2012	11/30/2011	11/30/2011
Volatile Organic Compounds (µg/L)								
XYLENE O	--	5 U	5 U	--	5 U	--	1 U	--
XYLENE P,M	--	5 U	5 U	--	5 U	--	**3.8**	--

Notes:
1. -- = Sample not analyzed for this parameter
2. U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
3. J = Estimated value
4. UJ = Not detected (reporting limit approximate)
5. Bold = Detected

Table 3-4
2011 Geophysical Anomaly Area Observation Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Test Pit	Transect	Date	Time	Depth of Transect (ft bgs)	Width of Transect (ft)	Length of Transect (ft)	Top Depth (ft bgs)	Bottom Depth (ft bgs)	Fill or Natural Soils Observed (F/N)	Soil Jar Headspace PID (ppm)	Odor Observed (Y/N)	Debris Observed (Y/N)	Type of Debris	Sample Collected for Laboratory Analysis (Y/N)	Laboratory Sample Description	Laboratory Sample ID	Soil Jar Headspace for Laboratory Analyzed Samples (ppm)
							0	2	F	0	N	N	None encountered	N	NA	NA	NA
							2	4	F	0	N	N	None encountered	N	NA	NA	NA
							4	6	F	0	N	Y	Metal cable, rusted drum cover	N	NA	NA	NA
							6	8	F	1.1	N	Y	Large flat yellow-painted metal panel	N	NA	NA	NA
1	1A	11/16/2011	940	10	4	12	8	10	F	2.2	N	N	None encountered	N	NA	NA	NA
							0	2	F	0	N	N	None encountered	N	NA	NA	NA
							2	4	F	0	N	N	None encountered	N	NA	NA	NA
1	1B	11/16/2011	1030	7	4	5	4	7	F	0.7	Y	Y	Rusted metal drum with ~1 ft^3 residual yellow-brown blocky material, sweet odor	Y	Yellow-brown material from drum	TR1B-4 (4-6)	>100
							0	2	F	0	N	N	None encountered	N	NA	NA	NA
							2	4	F	2.7	N	N	None encountered	N	NA	NA	NA
							4	6	F	23.7	Y	Y	Approximately 5-gallon rusted metal container with hard, somewhat viscous, shiny black material adhered to sides	N	NA	NA	NA
1	1C	11/16/2011	1110	7	4	10	6	7	F	49.3	N	N	None encountered	Y	Soil - base of transect 1	GP-TR1 (5-7)	49.3
							0	2	F	0.8	N	N	None encountered	N	NA	NA	NA
							2	4	F	0.8	N	Y	Metal cable, yellow-painted metal panels	N	NA	NA	NA
							4	6	F	1	N	Y	Metal cable, yellow-painted metal panels. Empty rusted drum.	N	NA	NA	NA
1	2A	11/16/2011	1210	8	12	13	6	8	F	1.9	Y	Y	Labeled rusted metal drum with *de minimus* yellow brown material	N	NA	NA	NA
							0	2	F	0	N	N	None encountered	N	NA	NA	NA
							2	4	F	0.5	N	Y	Metal scraps, cable, yellow-painted metal sheeting, metal filing cabinet with fibrous insulation	Y	Fibrous insulation	TR-2B-Cabinet	NA
							4	6	F	1.2	N	Y	2 rusted empty drums	N	NA	NA	NA
1	2B	11/16/2011	1250	8	12	14	6	8	F	10	Y	N	None encountered	Y	2	GP-TR2 (6-8)	810
							0	2	F	1.1	N	N	None encountered	N	NA	NA	NA
							2	4	F	1.6	N	Y	Discarded airplane landing gear with blue corrosion, dozens of small fabric-wrapped metal canisters containing 2-pronged fuse	N	NA	NA	NA
1	3A	11/16/2011	1400	6	10	15	4	6	F	2	N	Y	Large 2x4x3 foot metal rectangular open box with about 5 gallons of purplish ash-like material inside	Y	Purplish ash solid	TR3A-Box	5.4
							0	2	F	2.7	N	N	None encountered	N	NA	NA	NA
							2	4	F	3.4	N	N	None encountered	N	NA	NA	NA
							4	6	F	4.9	N	Y	Hardened yellow blocky material, maybe old paint, less than 5 gallons	Y	Yellow blocky material	TR3B-YP	650
							4	6	F	4.9	N	Y	Rusted metal drum with several inches of residual yellow-brown blocky material, sweet odor	Y	Yellow-brown material from drum	TR3B-4 (4-4.5)	>100
1	3B	11/16/2011	1425	8	10	12	6	7	F	30.6	N	N	None encountered	Y	Soil - base of transect 3	GP-TR3B (6-6.5)	30.6

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Table 3-4
2011 Geophysical Anomaly Area Observation Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Test Pit	Transect	Date	Time	Depth of Transect (ft bgs)	Width of Transect (ft)	Length of Transect (ft)	Top Depth (ft bgs)	Bottom Depth (ft bgs)	Fill or Natural Soils Observed (F/N)	Soil Jar Headspace PID (ppm)	Odor Observed (Y/N)	Debris Observed (Y/N)	Type of Debris	Sample Collected for Laboratory Analysis (Y/N)	Laboratory Sample Description	Laboratory Sample ID	Soil Jar Headspace for Laboratory Analyzed Samples (ppm)
							0	2	F	0.1	N	N	None encountered	N	NA	NA	NA
							2	4	N	0.1	N	N	None encountered	N	NA	NA	NA
2	1A	11/17/2011	800	6	10	10	4	6	N	1.1	N	N	None encountered	N	NA	NA	NA
							0	2	F	0.1	N	N	None encountered	N	NA	NA	NA
							2	4	F	0.1	N	N	None encountered	N	NA	NA	NA
2	1B	11/17/2011	925	6	10	10	4	6	F	0.3	N	Y	Sidewall of large metal object mostly buried in transect 2B	Y	Soil - base of transect 1	GP2-TR1B (6-6.5)	0.3
							0	2	F	0.1	N	N	None encountered	N	NA	NA	NA
2	1C	11/17/2011	940	6	10	10	2	4	F	0.3	N	Y	Blocky cementitious material; rusted refrigerator and radiator with fibrous orange insulation; metal cable	Y	Refrigerator insulation	TR-1C-INS	NA
							4	6	F	0.3	N	Y	Metal cable; skid steer tire	N	NA	NA	NA
							0	2	F	0.1	N	N	None encountered	N	NA	NA	NA
							2	4	F	0.3	N	Y	Metal wire	N	NA	NA	NA
2	1D	11/17/2011	1035	6	10	10	4	6	F	0.3	N	N	None encountered	N	NA	NA	NA
							0	2	F	0.1	N	N	None encountered	N	NA	NA	NA
							2	4	F	0.2	N	N	None encountered	N	NA	NA	NA
							4	6	F	0.3	N	Y	Three rusted metal drums, 2 empty and 1 apparently full of white crystalline powder	Y	White powder from drum	WC-1	0.1
2	2A	11/17/2011	1110	7	10	10	6	7	F	0.1	N	N	None encountered	Y	Soil - base of west end of transect 2	GP2-TR2A (6-7)	0.5
							0	2	F	0.1	N	N	None encountered	N	NA	NA	NA
							2	4	F	0.3	N	Y	12" o.d. flexible black rubber covered metal coiled pipe, possible former water line; empty metal box/platform	N	NA	NA	NA
2	2B	11/17/2011	1240	6	10	10	4	6	F	0.4	N	Y	None encountered	N	NA	NA	NA
							0	2	F	0.1	N	N	None encountered	N	NA	NA	NA
							2	4	F	2.8	N	Y	Metal cable, metal scraps, sheet metal	N	NA	NA	NA
2	2C	11/17/2011	1250	6	10	10	4	6	F	3	N	Y	Metal cable, metal scraps, sheet metal	N	NA	NA	NA
							0	2	F	0.1	N	N	None encountered	N	NA	NA	NA
							2	4	F	3.6	N	Y	sheet metal	N	NA	NA	NA
							4	6	F	2.8	N	Y	sheet metal	N	NA	NA	NA
2	2D	11/17/2011	1340	7	10	10	6	7	F	2.6	N	N	None encountered	Y	Soil - base of east end of transect 2	GP2-TR2D (6-7)	3.6
							0	2	F	NA	N	N	None encountered	N	NA	NA	NA
							2	4	F	NA	N	Y	12" o.d. flexible black rubber covered metal coiled pipe, possible former water line	N	NA	NA	NA
2	3A	11/17/2011	1210	6	12	15	4	6	F	NA	N	N	None encountered	N	NA	NA	NA

Notes:
NA - Not Applicable
F/N - Fill or Natural Soil observed
Y/N - Yes or No
ft bgs - feet below ground surface
ppm - parts per million

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Table 3-5
2011 Geophysical Anomaly Area Waste Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Sample Number[a]	Sample Date	Sample Type	Analyte	Validated Result[b]	Result Units
Residual Waste Samples					
TR1B-4 4-6	16-Nov-11	N	CIS-1,2-DICHLOROETHENE	133000	µg/kg
TR1B-4 4-6	16-Nov-11	N	ETHYLBENZENE	1230000	µg/kg
TR1B-4 4-6	16-Nov-11	N	METHYLENE CHLORIDE	282000	µg/kg
TR1B-4 4-6	16-Nov-11	N	NAPHTHALENE	24600	µg/kg
TR1B-4 4-6	16-Nov-11	N	TETRACHLOROETHENE	55800	µg/kg
TR1B-4 4-6	16-Nov-11	N	TOLUENE	350000	µg/kg
TR1B-4 4-6	16-Nov-11	N	TRICHLOROETHENE	814000	µg/kg
TR3A-Box	16-Nov-11	N	SILVER	90.4	mg/kg
TR3B-4 4-4.5	16-Nov-11	N	ETHYLBENZENE	396000	µg/kg
TR3B-4 4-4.5	16-Nov-11	N	METHYLENE CHLORIDE	132000	µg/kg
TR3B-4 4-4.5	16-Nov-11	N	TOLUENE	64200	µg/kg
TR3B-4 4-4.5	16-Nov-11	N	TRICHLOROETHENE	120000	µg/kg
TR3B-YP	16-Nov-11	N	CHROMIUM	33900	mg/kg
TR3B-YP	16-Nov-11	N	4-METHYL-2-PENTANONE	6020000	µg/kg
TR3B-YP	16-Nov-11	N	ETHYLBENZENE	4450000	µg/kg
TR3B-YP	16-Nov-11	N	TOLUENE	3750000	µg/kg
TR3B-YP	16-Nov-11	N	TRICHLOROETHENE	85700	µg/kg
WC-1	17-Nov-11	N	ARSENIC	6.1	mg/kg

Notes:
a: Sample depth interval suffix indicates depth below ground surface, in feet
b: ADR data validation confirmed that chemicals were detected at concentration reported without further qualification.
mg/kg: milligrams per kilogram
µg/kg: micrograms per kilogram
mg/l: milligrams per liter

Table 3-6
2011 Geophysical Anomaly Area Soil Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Sample ID (Depth interval, ft) [a]	Date and Time Collected	Parameter	Validated Result[b][d]	Result Units	EPA RSL[c]
Geophysical Anomaly Area - Test Pit 1 - Bottom Soil Samples					
GP-TR1 5-7	11/16/2011 11:30	1,2,4-TRIMETHYLBENZENE	63300	µg/kg	300000
GP-TR1 5-7	11/16/2011 11:30	1,3,5-TRIMETHYLBENZENE	14700	µg/kg	270000
GP-TR1 5-7	11/16/2011 11:30	CIS-1,2-DICHLOROETHENE	114	µg/kg	160000
GP-TR1 5-7	11/16/2011 11:30	ETHYLBENZENE	1890	µg/kg	5800
GP-TR1 5-7	11/16/2011 11:30	ISOPROPYLBENZENE	1070	µg/kg	1900000
GP-TR1 5-7	11/16/2011 11:30	M,P-XYLENE	5690	µg/kg	550000
GP-TR1 5-7	11/16/2011 11:30	NAPHTHALENE	35.7	µg/kg	2000
GP-TR1 5-7	11/16/2011 11:30	N-PROPYLBENZENE	9050	µg/kg	3800000
GP-TR1 5-7	11/16/2011 11:30	O-XYLENE	3480	µg/kg	650000
GP-TR1 5-7	11/16/2011 11:30	P-ISOPROPYLTOLUENE	750	µg/kg	N/A
GP-TR1 5-7	11/16/2011 11:30	SEC-BUTYLBENZENE	1960	µg/kg	7800000
GP-TR1 5-7	11/16/2011 11:30	TETRACHLOROETHENE	165	µg/kg	24000
GP-TR1 5-7	11/16/2011 11:30	TOLUENE	330	µg/kg	4900000
GP-TR1 5-7	11/16/2011 11:30	TRICHLOROETHENE	**2140**	µg/kg	940
GP-TR2 6-8	11/16/2011 13:15	ARSENIC	**2.8**	mg/kg	0.68
GP-TR2 6-8	11/16/2011 13:15	BARIUM	8.5	mg/kg	15000
GP-TR2 6-8	11/16/2011 13:15	CADMIUM	0.1	mg/kg	71
GP-TR2 6-8	11/16/2011 13:15	CHROMIUM[e]	13.4	mg/kg	120000
GP-TR2 6-8	11/16/2011 13:15	LEAD	32.8	mg/kg	400
GP-TR2 6-8	11/16/2011 13:15	1,1-DICHLOROETHANE	48.5	µg/kg	3600
GP-TR2 6-8	11/16/2011 13:15	1,2,4-TRIMETHYLBENZENE	14200	µg/kg	300000
GP-TR2 6-8	11/16/2011 13:15	1,3,5-TRIMETHYLBENZENE	3670	µg/kg	270000
GP-TR2 6-8	11/16/2011 13:15	2-BUTANONE	2790	µg/kg	27000000
GP-TR2 6-8	11/16/2011 13:15	4-METHYL-2-PENTANONE	358000	µg/kg	33000000
GP-TR2 6-8	11/16/2011 13:15	ACETONE	2280	µg/kg	61000000
GP-TR2 6-8	11/16/2011 13:15	BENZENE	475	µg/kg	1200
GP-TR2 6-8	11/16/2011 13:15	CIS-1,2-DICHLOROETHENE	153	µg/kg	160000
GP-TR2 6-8	11/16/2011 13:15	ETHYLBENZENE	**77900**	µg/kg	5800
GP-TR2 6-8	11/16/2011 13:15	ISOPROPYLBENZENE	715	µg/kg	1900000
GP-TR2 6-8	11/16/2011 13:15	M,P-XYLENE	372000	µg/kg	550000
GP-TR2 6-8	11/16/2011 13:15	METHYLENE CHLORIDE	1060	µg/kg	57000
GP-TR2 6-8	11/16/2011 13:15	NAPHTHALENE	74.9	µg/kg	2000
GP-TR2 6-8	11/16/2011 13:15	N-PROPYLBENZENE	2040	µg/kg	3800000
GP-TR2 6-8	11/16/2011 13:15	O-XYLENE	116000	µg/kg	650000
GP-TR2 6-8	11/16/2011 13:15	P-ISOPROPYLTOLUENE	172	µg/kg	N/A
GP-TR2 6-8	11/16/2011 13:15	SEC-BUTYLBENZENE	398	µg/kg	7800000
GP-TR2 6-8	11/16/2011 13:15	TETRACHLOROETHENE	154	µg/kg	24000
GP-TR2 6-8	11/16/2011 13:15	TOLUENE	433000	µg/kg	4900000
GP-TR2 6-8	11/16/2011 13:15	TRICHLOROETHENE	**2580**	µg/kg	940

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Table 3-6
2011 Geophysical Anomaly Area Soil Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Sample ID (Depth interval, ft) [a]	Date and Time Collected	Parameter	Validated Result[b][d]	Result Units	EPA RSL[c]
Geophysical Anomaly Area - Test Pit 1 - Bottom Soil Samples (Continued)					
GP-TR3B 6-6.5	11/16/2011 15:00	ARSENIC	**3.1**	mg/kg	0.68
GP-TR3B 6-6.5	11/16/2011 15:00	BARIUM	9.1	mg/kg	15000
GP-TR3B 6-6.5	11/16/2011 15:00	CADMIUM	0.2	mg/kg	71
GP-TR3B 6-6.5	11/16/2011 15:00	CHROMIUM	6.9	mg/kg	120000
GP-TR3B 6-6.5	11/16/2011 15:00	LEAD	21.6	mg/kg	400
GP-TR3B 6-6.5	11/16/2011 15:00	1,2,4-TRIMETHYLBENZENE	12400	µg/kg	300000
GP-TR3B 6-6.5	11/16/2011 15:00	1,3,5-TRIMETHYLBENZENE	2840	µg/kg	270000
GP-TR3B 6-6.5	11/16/2011 15:00	4-METHYL-2-PENTANONE	210	µg/kg	33000000
GP-TR3B 6-6.5	11/16/2011 15:00	CIS-1,2-DICHLOROETHENE	86.6	µg/kg	160000
GP-TR3B 6-6.5	11/16/2011 15:00	ETHYLBENZENE	321	µg/kg	5800
GP-TR3B 6-6.5	11/16/2011 15:00	ISOPROPYLBENZENE	195	µg/kg	1900000
GP-TR3B 6-6.5	11/16/2011 15:00	M,P-XYLENE	1050	µg/kg	550000
GP-TR3B 6-6.5	11/16/2011 15:00	N-PROPYLBENZENE	1600	µg/kg	3800000
GP-TR3B 6-6.5	11/16/2011 15:00	O-XYLENE	644	µg/kg	650000
GP-TR3B 6-6.5	11/16/2011 15:00	P-ISOPROPYLTOLUENE	145	µg/kg	N/A
GP-TR3B 6-6.5	11/16/2011 15:00	SEC-BUTYLBENZENE	378	µg/kg	7800000
GP-TR3B 6-6.5	11/16/2011 15:00	TETRACHLOROETHENE	50.9	µg/kg	24000
GP-TR3B 6-6.5	11/16/2011 15:00	TOLUENE	131	µg/kg	4900000
GP-TR3B 6-6.5	11/16/2011 15:00	TRICHLOROETHENE	715	µg/kg	940
Geophysical Anomaly Area - Test Pit 2 - Bottom Soil Samples					
GP2-TR1B 6-6.5	11/17/2011 11:00	ARSENIC	**2.1**	mg/kg	0.68
GP2-TR1B 6-6.5	11/17/2011 11:00	BARIUM	5.3	mg/kg	15000
GP2-TR1B 6-6.5	11/17/2011 11:00	CHROMIUM[e]	2.3	mg/kg	120000
GP2-TR1B 6-6.5	11/17/2011 11:00	LEAD	3.4	mg/kg	400
GP2-TR1B 6-6.5	11/17/2011 11:00	ETHYLBENZENE	2.1	µg/kg	5800
GP2-TR1B 6-6.5	11/17/2011 11:00	M,P-XYLENE	13	µg/kg	550000
GP2-TR1B 6-6.5	11/17/2011 11:00	O-XYLENE	4.2	µg/kg	650000
GP2-TR1B 6-6.5	11/17/2011 11:00	TOLUENE	2.5	µg/kg	4900000
GP2-TR1B 6-6.5	11/17/2011 11:00	TRICHLOROETHENE	1.8	µg/kg	940
GP2-TR2A 6-7	11/17/2011 11:45	ARSENIC	**1.9**	mg/kg	0.68
GP2-TR2A 6-7	11/17/2011 11:45	BARIUM	10.5	mg/kg	15000
GP2-TR2A 6-7	11/17/2011 11:45	CADMIUM	0.7	mg/kg	71
GP2-TR2A 6-7	11/17/2011 11:45	CHROMIUM[e]	6.0	mg/kg	120000
GP2-TR2A 6-7	11/17/2011 11:45	LEAD	25.6	mg/kg	400
GP2-TR2A 6-7	11/17/2011 11:45	2-BUTANONE	7.2	µg/kg	27000000
GP2-TR2A 6-7	11/17/2011 11:45	ACETONE	70	µg/kg	61000000
GP2-TR2A 6-7	11/17/2011 11:45	ETHYLBENZENE	2.3	µg/kg	5800
GP2-TR2A 6-7	11/17/2011 11:45	M,P-XYLENE	13.8	µg/kg	550000
GP2-TR2A 6-7	11/17/2011 11:45	O-XYLENE	3.3	µg/kg	650000
GP2-TR2A 6-7	11/17/2011 11:45	TOLUENE	4.1	µg/kg	4900000

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Table 3-6
2011 Geophysical Anomaly Area Soil Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Sample ID (Depth interval, ft) [a]	Date and Time Collected	Parameter	Validated Result[b][d]	Result Units	EPA RSL[c]
Geophysical Anomaly Area - Test Pit 2 - Bottom Soil Samples (Continued)					
GP2-TR2A 6-7	11/17/2011 11:45	TRICHLOROETHENE	3.4	µg/kg	940
GP2-TR2D 6-7	11/17/2011 13:45	ARSENIC	**2.8**	mg/kg	0.68
GP2-TR2D 6-7	11/17/2011 13:45	BARIUM	8.0	mg/kg	15000
GP2-TR2D 6-7	11/17/2011 13:45	CADMIUM	0.7	mg/kg	71
GP2-TR2D 6-7	11/17/2011 13:45	CHROMIUM[e]	2.4	mg/kg	120000
GP2-TR2D 6-7	11/17/2011 13:45	LEAD	17.2	mg/kg	400
GP2-TR2D 6-7	11/17/2011 13:45	ETHYLBENZENE	2.1	µg/kg	5800
GP2-TR2D 6-7	11/17/2011 13:45	M,P-XYLENE	12.2	µg/kg	550000
GP2-TR2D 6-7	11/17/2011 13:45	O-XYLENE	3.4	µg/kg	650000
GP2-TR2D 6-7	11/17/2011 13:45	TOLUENE	2.5	µg/kg	4900000
GP2-TR2D 6-7	11/17/2011 13:45	TRICHLOROETHENE	5.8	µg/kg	940

Notes:
a: Sample depth interval suffix indicates depth below ground surface, in feet
b: ADR data validation confirmed that chemicals were detected at concentration reported without further qualification.
c: EPA RSL for Resident Soil with TR=10E-06 and THQ=1.0 (units correspond to those of the parameter)
d: Shaded values exceed EPA RSL for Resident Soil
e: Total chromium was reported by the laboratory. Results compared to regulatory criteria for chromium (III)
mg/kg: milligrams per kilogram
µg/kg: micrograms per kilogram
mg/l: milligrams per liter
N/A: Regulatory criteria not specified

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Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	BEACH-1-MW1-1115	Beach-1-MW2-1820		Beach-1-MW2-1820-F	BEACH-4-MW1-1315	Beach-4-MW2-1820		Beach-4-MW2-1820-F	Beach-6-MW1-1315		Beach-6-MW1-1315-F	
Sample ID	BEACH -1-MW1-1115	BEACH -1-MW2-1820	Beach-1-MW2-1820	Beach-1-MW2-1820-F	BEACH-4-MW1-1315	BEACH -4-MW2-1820	Beach-4-MW2-1820	Beach-4-MW2-1820-F	BEACH-6-MW1-1315	DUP04	Beach-6-MW1-1315-F	DUP04-F
Sample Date	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/25/2014	7/25/2014	7/25/2014	7/25/2014
Start Depth (feet below ground)	11	18	18	18	13	18	18	18	13	13	13	13
End Depth (feet below ground)	15	20	20	20	15	20	20	20	15	15	15	15
Volatile Organic Compounds (µg/L)												
1,1-DICHLOROETHANE	1.0 U	**0.21 J**	--	--	0.5 U	**0.14 J**	--	--	0.25 U	0.25 U	--	--
1,1-DICHLOROETHENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,1-DICHLOROPROPENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,1,1-TRICHLOROETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,1,1,2-TETRACHLOROETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,1,2-TRICHLOROETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,1,2,2-TETRACHLOROETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,2-DIBROMO-3-CHLOROPROPANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,2-DIBROMOETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,2-DICHLOROBENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,2-DICHLOROETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,2-DICHLOROPROPANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,2,3-TRICHLOROBENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,2,3-TRICHLOROPROPANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,2,4-TRICHLOROBENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,2,4-TRIMETHYLBENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,3-DICHLOROBENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,3-DICHLOROPROPANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,3,5-TRIMETHYLBENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
1,4-DICHLOROBENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
2-BUTANONE (MEK)	20 U	5.0 U	--	--	10 U	5.0 U	--	--	5.0 U	5.0 U	--	--
2-CHLOROTOLUENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
2-HEXANONE	10 U	2.5 U	--	--	5.0 U	2.5 U	--	--	2.5 U	2.5 U	--	--
2,2-DICHLOROPROPANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
4-CHLOROTOLUENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
4-ISOPROPYLTOLUENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
4-METHYL-2-PENTANONE	10 U	2.5 U	--	--	5.0 U	2.5 U	--	--	2.5 U	2.5 U	--	--
ACETONE	**68 J**	5.0 U	--	--	10 U	5.0 U	--	--	5.0 U	5.0 U	--	--
BENZENE	1.0 U	**0.13 J**	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
BROMOBENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
BROMOCHLOROMETHANE	2.0 U	0.5 U	--	--	1.0 U	0.5 U	--	--	0.50 U	0.50 U	--	--
BROMODICHLOROMETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
BROMOFORM	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
CARBON DISULFIDE	**4.3**	**4.0**	--	--	**2.8**	**0.9**	--	--	0.25 U	0.25 U	--	--
CARBON TETRACHLORIDE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
CHLOROBENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
CHLOROETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
CHLOROFORM	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
CHLOROMETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
CIS-1,2-DICHLOROETHENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
CIS-1,3-DICHLOROPROPENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
DIBROMOCHLOROMETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
DIBROMOMETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
DICHLORODIFLUOROMETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
DIISOPROPYL ETHER	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
ETHYLBENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
HEXACHLOROBUTADIENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
ISOPROPYLBENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
METHYL BROMIDE	2.4 U	0.59 U	--	--	1.2 U	0.59 U	--	--	0.59 U	0.59 U	--	--
METHYL TERT-BUTYL ETHER	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
METHYLENE CHLORIDE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
N-BUTYL BENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
N-HEXANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
N-PROPYL BENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
NAPHTHALENE	1.0 U	0.25 U	--	--	0.5 U	**0.29 J**	--	--	0.25 U	0.25 U	--	--
SEC-BUTYL BENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
STYRENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
TERT-BUTYLBENZENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--

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Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	BEACH-1-MW1-1115	Beach-1-MW2-1820		Beach-1-MW2-1820-F	BEACH-4-MW1-1315	Beach-4-MW2-1820		Beach-4-MW2-1820-F	Beach-6-MW1-1315		Beach-6-MW1-1315-F	
Sample ID	BEACH -1-MW1-1115	BEACH -1-MW2-1820	Beach-1-MW2-1820	Beach-1-MW2-1820-F	BEACH-4-MW1-1315	BEACH -4-MW2-1820	Beach-4-MW2-1820	Beach-4-MW2-1820-F	BEACH-6-MW1-1315	DUP04	Beach-6-MW1-1315-F	DUP04-F
Sample Date	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/25/2014	7/25/2014	7/25/2014	7/25/2014
Start Depth (feet below ground)	11	18	18	18	13	18	18	18	13	13	13	13
End Depth (feet below ground)	15	20	20	20	15	20	20	20	15	15	15	15
Volatile Organic Compounds (µg/L)												
TETRACHLOROETHENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
TETRAHYDROFURAN	10 U	2.5 U	--	--	5.0 U	2.5 U	--	--	2.5 U	2.5 U	--	--
TOLUENE	1.0 U	**0.14 J**	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
TRANS-1,2-DICHLOROETHENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
TRANS-1,3-DICHLOROPROPENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
TRICHLOROETHYLENE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	**0.15 J**	0.25 U	--	--
TRICHLOROFLUOROMETHANE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
VINYL CHLORIDE	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
XYLENE O	1.0 U	0.25 U	--	--	0.5 U	0.25 U	--	--	0.25 U	0.25 U	--	--
XYLENE P,M	2.0 U	0.5 U	--	--	1.0 U	0.50 U	--	--	0.5 U	0.5 U	--	--
RCRA8 Metals (µg/L)												
Dissolved												
ARSENIC	--	--	--	**1.3 J**	--	--	--	1.0 U	--	--	**1.3 J**	**1 J**
BARIUM	--	--	--	**30.1**	--	--	--	**166**	--	--	**65.9**	**70.5**
CADMIUM	--	--	--	0.1 U	--	--	--	0.1 U	--	--	0.1 U	0.1 U
CHROMIUM	--	--	--	**8.5 J**	--	--	--	3 U	--	--	3 U	3 U
LEAD	--	--	--	1.0 U	--	--	--	1.0 U	--	--	1.0 U	1.0 U
MERCURY	--	--	--	0.2 U	--	--	--	0.2 U	--	--	0.2 U	0.2 U
SELENIUM	--	--	--	2.0 U	--	--	--	2.0 U	--	--	2.0 U	2.0 U
SILVER	--	--	--	0.1 U	--	--	--	0.1 U	--	--	0.1 U	0.1 U
Total												
ARSENIC	--	--	**1 J**	--	--	--	1.0 U	--	**1.6 J**	**1.6 J**	--	--
BARIUM	--	--	**32.6**	--	--	--	**175**	--	**65.2**	**71.5**	--	--
CADMIUM	--	--	0.1 U	--	--	--	0.1 U	--	0.1 U	0.1 U	--	--
CHROMIUM	--	--	**20.4**	--	--	--	**54.3**	--	**4.2 J**	**7.5 J**	--	--
LEAD	--	--	1.0 U	--	--	--	**1.7 J**	--	1.0 U	1.0 U	--	--
MERCURY	--	--	0.2 U	--	--	--	0.2 U	--	0.2 U	0.2 U	--	--
SELENIUM	--	--	2.0 U	--	--	--	2.0 U	--	2.0 U	2.0 U	--	--
SILVER	--	--	0.1 U	--	--	--	0.1 U	--	0.1 U	0.1 U	--	--

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	Beach-6-MW2-1822	Beach-6-MW2-1822-F	Beach-6-MW4-2830	Beach-6-MW4-2830-F	Beach-7-MW1-1315	Beach-7-MW1-1315-F	Beach-7-MW2-1820	Beach-7-MW2-1820-F	BEACH-7A-MW5-3134	Beach-8-MW1-1315	Beach-8-MW1-1315-F
Sample ID	BEACH-6-MW2-1822	Beach-6-MW2-1822-F	BEACH-6-MW4-2830	Beach-6-MW4-2830-F	BEACH-7-MW1-1315	Beach-7-MW1-1315-F	BEACH-7-MW2-1820	Beach-7-MW2-1820-F	BEACH-7A-MW5-3134	BEACH-8-MW1-1315	Beach-8-MW1-1315-F
Sample Date	7/25/2014	7/25/2014	7/25/2014	7/25/2014	7/25/2014	7/25/2014	7/25/2014	7/25/2014	7/28/2014	7/28/2014	7/28/2014
Start Depth (feet below ground)	18	18	28	28	13	13	18	18	31	13	13
End Depth (feet below ground)	22	22	30	30	15	15	20	20	34	15	15
Volatile Organic Compounds (µg/L)											
1,1-DICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,1-DICHLOROETHENE	0.25 U	--	**0.37 J**	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,1-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,1,1-TRICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,1,1,2-TETRACHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,1,2-TRICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,1,2,2-TETRACHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,2-DIBROMO-3-CHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,2-DIBROMOETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,2-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,2-DICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,2-DICHLOROPROPANE	**3.0**	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,2,3-TRICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,2,3-TRICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,2,4-TRICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,2,4-TRIMETHYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,3-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,3-DICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,3,5-TRIMETHYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
1,4-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
2-BUTANONE (MEK)	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	5.0 U	
2-CHLOROTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
2-HEXANONE	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U	
2,2-DICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
4-CHLOROTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
4-ISOPROPYLTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
4-METHYL-2-PENTANONE	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U	
ACETONE	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	**32**	5.0 U	
BENZENE	**0.36 J**	--	**0.11 J**	--	0.25 U	--	0.25 U	--	**0.63**	0.25 U	
BROMOBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
BROMOCHLOROMETHANE	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	0.5 U	
BROMODICHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
BROMOFORM	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
CARBON DISULFIDE	**0.64**	--	**0.49 J**	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
CARBON TETRACHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
CHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
CHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
CHLOROFORM	**0.6**	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
CHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	**1.2 J**	0.25 U	
CIS-1,2-DICHLOROETHENE	0.25 U	--	**4.5**	--	**0.24 J**	--	**2.0**	--	**0.89**	0.25 U	
CIS-1,3-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
DIBROMOCHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
DIBROMOMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
DICHLORODIFLUOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
DIISOPROPYL ETHER	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
ETHYLBENZENE	**0.09 J**	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
HEXACHLOROBUTADIENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
ISOPROPYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
METHYL BROMIDE	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	0.59 U	
METHYL TERT-BUTYL ETHER	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
METHYLENE CHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	**0.16 J**	0.25 U	
N-BUTYL BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
N-HEXANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
N-PROPYL BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
NAPHTHALENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
SEC-BUTYL BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
STYRENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
TERT-BUTYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	Beach-6-MW2-1822	Beach-6-MW2-1822-F	Beach-6-MW4-2830	Beach-6-MW4-2830-F	Beach-7-MW1-1315	Beach-7-MW1-1315-F	Beach-7-MW2-1820	Beach-7-MW2-1820-F	BEACH-7A-MW5-3134	Beach-8-MW1-1315	Beach-8-MW1-1315-F
Sample ID	BEACH-6-MW2-1822	Beach-6-MW2-1822-F	BEACH-6-MW4-2830	Beach-6-MW4-2830-F	BEACH-7-MW1-1315	Beach-7-MW1-1315-F	BEACH-7-MW2-1820	Beach-7-MW2-1820-F	BEACH-7A-MW5-3134	BEACH-8-MW1-1315	Beach-8-MW1-1315-F
Sample Date	7/25/2014	7/25/2014	7/25/2014	7/25/2014	7/25/2014	7/25/2014	7/25/2014	7/25/2014	7/28/2014	7/28/2014	7/28/2014
Start Depth (feet below ground)	18	18	28	28	13	13	18	18	31	13	13
End Depth (feet below ground)	22	22	30	30	15	15	20	20	34	15	15
Volatile Organic Compounds (µg/L)											
TETRACHLOROETHENE	0.25 U	--	**0.09 J**	--	0.25 U	--	**0.29 J**	--	0.25 U	0.25 U	
TETRAHYDROFURAN	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U	
TOLUENE	**0.33 J**	--	**0.12 J**	--	0.25 U	--	0.25 U	--	**0.42 J**	0.25 U	
TRANS-1,2-DICHLOROETHENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
TRANS-1,3-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
TRICHLOROETHYLENE	**0.29 J**	--	**33**	--	**1.3**	--	**11**	--	**1.4**	0.25 U	
TRICHLOROFLUOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
VINYL CHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
XYLENE O	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	
XYLENE P,M	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	0.5 U	
RCRA8 Metals (µg/L)											
Dissolved											
ARSENIC	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	--	1.0 U
BARIUM	--	**94.5**	--	**35.4**	--	**5.4 J**	--	**10.6 J**	--	--	**14.5 J**
CADMIUM	--	0.1 U	--	0.1 U	--	**0.04 J**	--	**0.05 J**	--	--	**0.11 J**
CHROMIUM	--	3 U	--	3 U	--	3 U	--	3 U	--	--	3 U
LEAD	--	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--	--	1.0 U
MERCURY	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	--	0.2 U
SELENIUM	--	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--	--	2.0 U
SILVER	--	0.1 U	--	0.1 U	--	0.1 U	--	0.1 U	--	--	0.1 U
Total											
ARSENIC	**1.1 J**	--	1.0 U	--	**1.9 J**	--	**2.2 J**	--	--	1.0 U	--
BARIUM	**137**	--	**87**	--	**102**	--	**43.6**	--	--	**44**	--
CADMIUM	0.1 U	--	**0.19**	--	**0.37**	--	**0.12 J**	--	--	**0.21**	--
CHROMIUM	**382**	--	**209**	--	**44.3**	--	**85.8**	--	--	**59**	--
LEAD	**3.8**	--	**15.8**	--	**33**	--	**7.7**	--	--	**13.1**	--
MERCURY	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	--	0.2 U	--
SELENIUM	2.0 U	--	2.0 U	--	**1.4 J**	--	2.0 U	--	--	2.0 U	--
SILVER	0.1 U	--	0.1 U	--	0.1 U	--	0.1 U	--	--	0.1 U	--

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	Beach-8-MW2-1820	Beach-8-MW2-1820-F	Beach-8-MW3-2325	Beach-8-MW3-2325-F	Beach-8-MW5-3235	Beach-8-MW5-3235-F	Beach-8-MW6-3840	Beach-8-MW6-3840-F	TS-1-A-MW1-1315	TS-1-A-MW1-1315-F	TS-1-A-MW2-1820	
Sample ID	BEACH-8-MW2-1820	Beach-8-MW2-1820-F	BEACH-8-MW3-2325	Beach-8-MW3-2325-F	BEACH-8-MW5-3235	Beach-8-MW5-3235-F	BEACH-8-MW6-3840	Beach-8-MW6-3840-F	TS-1-A-MW1-1315	TS-1-A-MW1-1315-F	DUP08	TS-1-A-MW2-1820
Sample Date	7/28/2014	7/28/2014	7/28/2014	7/28/2014	7/25/2014	7/25/2014	7/25/2014	7/25/2014	8/4/2014	8/4/2014	8/4/2014	8/4/2014
Start Depth (feet below ground)	18	18	23	23	32	32	38	38	13	13	18	18
End Depth (feet below ground)	20	20	25	25	35	35	40	40	15	15	20	20
Volatile Organic Compounds (µg/L)												
1,1-DICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,1-DICHLOROETHENE	0.25 U	--	0.25 U	--	0.25 U	--	**0.27 J**	--	0.25 U	--	0.25 U	0.25 U
1,1-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,1,1-TRICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,1,1,2-TETRACHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,1,2-TRICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,1,2,2-TETRACHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2-DIBROMO-3-CHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2-DIBROMOETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2-DICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2-DICHLOROPROPANE	0.25 U	--	**2.5**	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2,3-TRICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2,3-TRICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2,4-TRICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2,4-TRIMETHYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,3-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,3-DICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,3,5-TRIMETHYLBENZENE	0.25 U	--	**0.27 J**	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,4-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
2-BUTANONE (MEK)	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	5.0 U
2-CHLOROTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
2-HEXANONE	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U
2,2-DICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
4-CHLOROTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
4-ISOPROPYLTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
4-METHYL-2-PENTANONE	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U
ACETONE	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	5.0 U
BENZENE	0.25 U	--	0.25 U	--	**0.18 J**	--	**0.13 J**	--	0.25 U	--	0.25 U	0.25 U
BROMOBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
BROMOCHLOROMETHANE	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	0.5 U
BROMODICHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
BROMOFORM	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CARBON DISULFIDE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	**1.5**	--	0.25 U	0.25 U
CARBON TETRACHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CHLOROFORM	0.25 U	--	0.25 U	--	**0.18 J**	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CIS-1,2-DICHLOROETHENE	0.25 U	--	0.25 U	--	0.25 U	--	**0.47 J**	--	0.25 U	--	0.25 U	0.25 U
CIS-1,3-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
DIBROMOCHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
DIBROMOMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
DICHLORODIFLUOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
DIISOPROPYL ETHER	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
ETHYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
HEXACHLOROBUTADIENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
ISOPROPYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
METHYL BROMIDE	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	0.59 U
METHYL TERT-BUTYL ETHER	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
METHYLENE CHLORIDE	0.25 U	--	0.25 U	--	**0.14 J**	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
N-BUTYL BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
N-HEXANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
N-PROPYL BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
NAPHTHALENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
SEC-BUTYL BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
STYRENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
TERT-BUTYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	Beach-8-MW2-1820	Beach-8-MW2-1820-F	Beach-8-MW3-2325	Beach-8-MW3-2325-F	Beach-8-MW5-3235	Beach-8-MW5-3235-F	Beach-8-MW6-3840	Beach-8-MW6-3840-F	TS-1-A-MW1-1315	TS-1-A-MW1-1315-F	TS-1-A-MW2-1820	
Sample ID	BEACH-8-MW2-1820	Beach-8-MW2-1820-F	BEACH-8-MW3-2325	Beach-8-MW3-2325-F	BEACH-8-MW5-3235	Beach-8-MW5-3235-F	BEACH-8-MW6-3840	Beach-8-MW6-3840-F	TS-1-A-MW1-1315	TS-1-A-MW1-1315-F	DUP08	TS-1-A-MW2-1820
Sample Date	7/28/2014	7/28/2014	7/28/2014	7/28/2014	7/25/2014	7/25/2014	7/25/2014	7/25/2014	8/4/2014	8/4/2014	8/4/2014	8/4/2014
Start Depth (feet below ground)	18	18	23	23	32	32	38	38	13	13	18	18
End Depth (feet below ground)	20	20	25	25	35	35	40	40	15	15	20	20
Volatile Organic Compounds (µg/L)												
TETRACHLOROETHENE	**0.14 J**	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
TETRAHYDROFURAN	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U
TOLUENE	0.25 U	--	0.25 U	--	**0.21 J**	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
TRANS-1,2-DICHLOROETHENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
TRANS-1,3-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
TRICHLOROETHYLENE	0.25 U	--	**0.17 J**	--	**0.92**	--	**20**	--	0.25 U	--	0.25 U	0.25 U
TRICHLOROFLUOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
VINYL CHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
XYLENE O	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
XYLENE P,M	0.5 U	--	**0.17 J**	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	0.5 U
RCRA8 Metals (µg/L)												
Dissolved												
ARSENIC	--	1.0 U	--	1.0 U	--	**1.7 J**	--	1.0 U	--	3 U	--	--
BARIUM	--	**16.5 J**	--	**13.8 J**	--	**35.8**	--	**21.5 J**	--	**52.2**	--	--
CADMIUM	--	0.18	--	**0.1 J**	--	0.1 U	--	0.1 U	--	**0.23 J**	--	--
CHROMIUM	--	22.9	--	**4.2 J**	--	3 U	--	**12.2**	--	**17.4 J**	--	--
LEAD	--	5.6	--	**0.7 J**	--	1.0 U	--	**1.5 J**	--	**3.7 J**	--	--
MERCURY	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	--
SELENIUM	--	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--	6 U	--	--
SILVER	--	0.1 U	--	0.1 U	--	0.1 U	--	0.1 U	--	0.5 U	--	--
Total												
ARSENIC	**1.8 J**	--	**0.7 J**	--	**10.8**	--	**5.7**	--	3 U	--	**2.7 J**	3 U
BARIUM	**69.6**	--	**52.2**	--	**451**	--	**154**	--	**66.4**	--	**74.8**	**61.8**
CADMIUM	**0.91**	--	**0.24**	--	**1.12**	--	**0.3**	--	**0.27 J**	--	**0.35 J**	**0.21 J**
CHROMIUM	**212**	--	**108**	--	**745**	--	**428**	--	**81.3**	--	**16.2 J**	**9.7 J**
LEAD	**50.4**	--	**22.3**	--	**82.9**	--	**41.4**	--	3 UJ	--	**2.8 J**	**15.3 J**
MERCURY	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	0.2 U
SELENIUM	2.0 U	--	2.0 U	--	**0.8 J**	--	2.0 U	--	6 U	--	6 U	2.0 U
SILVER	0.1 U	--	0.1 U	--	0.1 U	--	0.1 U	--	0.5 U	--	0.5 U	0.5 U

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-1-A-MW2-1820-F		TS-1-A-MW3-2325	TS-1-A-MW3-2325-F	TS-1-A-MW4-2729	TS-1-A-MW4-2729-F	TS-1-B-MW2-2124	TS-1-B-MW2-2124-F	TS-1-B-MW4-2530	TS-1-B-MW4-2530-F	TS-1-C-MW1-1316	TS-1-C-MW1-1316-F	TS-1-C-MW2-1922
Sample ID	DUP08-F	TS-1-A-MW2-1820-F	TS-1-A-MW3-2325	TS-1-A-MW3-2325-F	TS-1-A-MW4-2729	TS-1-A-MW4-2729-F	TS-1-B-MW2-2124	TS-1-B-MW2-2124-F	TS-1-B-MW4-2530	TS-1-B-MW4-2530-F	TS-1-C-MW1-1316	TS-1-C-MW1-1316-F	TS-1-C-MW2-1922
Sample Date	8/4/2014	8/4/2014	8/4/2014	8/4/2014	8/4/2014	8/4/2014	8/5/2014	8/5/2014	8/4/2014	8/4/2014	8/5/2014	8/5/2014	8/5/2014
Start Depth (feet below ground)	18	18	23	23	27	27	21	21	25	25	13	13	19
End Depth (feet below ground)	20	20	25	25	29	29	24	24	30	30	16	16	22
Volatile Organic Compounds (µg/L)													
1,1-DICHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,1-DICHLOROETHENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,1-DICHLOROPROPENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,1,1-TRICHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,1,1,2-TETRACHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,1,2-TRICHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,1,2,2-TETRACHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2-DIBROMO-3-CHLOROPROPANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2-DIBROMOETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2-DICHLOROBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2-DICHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2-DICHLOROPROPANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2,3-TRICHLOROBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2,3-TRICHLOROPROPANE	--	--	0.25 U	--	0.25 U	--	0.25 UJ	--	0.25 U	--	0.25 UJ	--	0.25 UJ
1,2,4-TRICHLOROBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2,4-TRIMETHYLBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,3-DICHLOROBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,3-DICHLOROPROPANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,3,5-TRIMETHYLBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,4-DICHLOROBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
2-BUTANONE (MEK)	--	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U
2-CHLOROTOLUENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
2-HEXANONE	--	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U
2,2-DICHLOROPROPANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
4-CHLOROTOLUENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
4-ISOPROPYLTOLUENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
4-METHYL-2-PENTANONE	--	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U
ACETONE	--	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U
BENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
BROMOBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
BROMOCHLOROMETHANE	--	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U
BROMODICHLOROMETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
BROMOFORM	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
CARBON DISULFIDE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	**1.4**	--	**0.96**	--	0.25 U
CARBON TETRACHLORIDE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
CHLOROBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
CHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
CHLOROFORM	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
CHLOROMETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
CIS-1,2-DICHLOROETHENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	**7.1**	--	0.25 U	--	0.25 U
CIS-1,3-DICHLOROPROPENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
DIBROMOCHLOROMETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
DIBROMOMETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
DICHLORODIFLUOROMETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
DIISOPROPYL ETHER	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
ETHYLBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
HEXACHLOROBUTADIENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
ISOPROPYLBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
METHYL BROMIDE	--	--	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U
METHYL TERT-BUTYL ETHER	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
METHYLENE CHLORIDE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
N-BUTYL BENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
N-HEXANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
N-PROPYL BENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
NAPHTHALENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
SEC-BUTYL BENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
STYRENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
TERT-BUTYLBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-1-A-MW2-1820-F		TS-1-A-MW3-2325	TS-1-A-MW3-2325-F	TS-1-A-MW4-2729	TS-1-A-MW4-2729-F	TS-1-B-MW2-2124	TS-1-B-MW2-2124-F	TS-1-B-MW4-2530	TS-1-B-MW4-2530-F	TS-1-C-MW1-1316	TS-1-C-MW1-1316-F	TS-1-C-MW2-1922
Sample ID	DUP08-F	TS-1-A-MW2-1820-F	TS-1-A-MW3-2325	TS-1-A-MW3-2325-F	TS-1-A-MW4-2729	TS-1-A-MW4-2729-F	TS-1-B-MW2-2124	TS-1-B-MW2-2124-F	TS-1-B-MW4-2530	TS-1-B-MW4-2530-F	TS-1-C-MW1-1316	TS-1-C-MW1-1316-F	TS-1-C-MW2-1922
Sample Date	8/4/2014	8/4/2014	8/4/2014	8/4/2014	8/4/2014	8/4/2014	8/5/2014	8/5/2014	8/4/2014	8/4/2014	8/5/2014	8/5/2014	8/5/2014
Start Depth (feet below ground)	18	18	23	23	27	27	21	21	25	25	13	13	19
End Depth (feet below ground)	20	20	25	25	29	29	24	24	30	30	16	16	22
Volatile Organic Compounds (µg/L)													
TETRACHLOROETHENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
TETRAHYDROFURAN	--	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U
TOLUENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
TRANS-1,2-DICHLOROETHENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
TRANS-1,3-DICHLOROPROPENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
TRICHLOROETHYLENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	**13**	--	0.25 U	--	0.25 U
TRICHLOROFLUOROMETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
VINYL CHLORIDE	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
XYLENE O	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
XYLENE P,M	--	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U
RCRA8 Metals (µg/L)													
Dissolved													
ARSENIC	3 U	3 U	--	3 U	--	3 U	--	**1.1 J**	--	3 U	--	3 U	--
BARIUM	**51.8**	**64.4 J**	--	**55.5 J**	--	**49.1 J**	--	**106 J**	--	**40.7**	--	**49.2 J**	--
CADMIUM	0.5 U	**0.46 J**	--	**0.41 J**	--	**0.38 J**	--	0.62 U	--	0.5 U	--	**0.42 J**	--
CHROMIUM	6 U	**2.4 J**	--	**8.2 J**	--	**1.7 J**	--	**2.7 J**	--	**3.5 J**	--	**6.7 J**	--
LEAD	3 UJ	**2.2 J**	--	**3.6 J**	--	3 UJ	--	**20.5**	--	**1.6 J**	--	3 U	--
MERCURY	0.2 U	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--
SELENIUM	6 U	6 U	--	6 U	--	6 U	--	2.0 U	--	2.0 U	--	6 U	--
SILVER	0.3 U	0.3 U	--	0.3 U	--	0.3 U	--	0.5 U	--	0.3 U	--	0.3 U	--
Total													
ARSENIC	--	--	**0.8 J**	--	3 U	--	3 U	--	**2.3 J**	--	3 U	--	**3.8 J**
BARIUM	--	--	**59.3**	--	**52.1**	--	**111 J**	--	**77.6**	--	**55.7 J**	--	**53.1 J**
CADMIUM	--	--	**0.43 J**	--	**0.67**	--	0.62 U	--	**0.65**	--	0.5 U	--	**1.14**
CHROMIUM	--	--	**56.8**	--	**2.1 J**	--	**29.3 J**	--	**288**	--	**24 J**	--	**14.1 J**
LEAD	--	--	**17.4 J**	--	3 UJ	--	**3.9 J**	--	**5.1 J**	--	**5.1 J**	--	3 U
MERCURY	--	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U
SELENIUM	--	--	2.0 U	--	6 U	--	6 U	--	2.0 U	--	6 U	--	6 U
SILVER	--	--	0.3 U	--	0.3 U	--	0.5 U	--	0.3 U	--	0.5 U	--	0.3 U

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-1-C-MW2-1922-F	TS-1-C-MW3-2427	TS-1-C-MW3-2427-F	TS-1-C-MW4-2932	TS-1-C-MW4-2932-F	TS-1-C-MW5-3538	TS-1-C-MW5-3538-F	TS-2-A-1518	TS-2-A-1518-F	TS-2-A-MW1-1518	TS-2-A-MW3-2325	TS-2-A-MW3-2325-F
Sample ID	TS-1-C-MW2-1922-F	TS-1-C-MW3-2427	TS-1-C-MW3-2427-F	TS-1-C-MW4-2932	TS-1-C-MW4-2932-F	TS-1-C-MW5-3538	TS-1-C-MW5-3538-F	TS-2-A-1518	TS-2-A-1518-F	TS-2-A-MW1-1518	TS-2-A-MW3-2325	TS-2-A-MW3-2325-F
Sample Date	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014
Start Depth (feet below ground)	19	24	24	29	29	35	35	15	15	15	23	23
End Depth (feet below ground)	22	27	27	32	32	38	38	18	18	18	25	25
Volatile Organic Compounds (µg/L)												
1,1-DICHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,1-DICHLOROETHENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,1-DICHLOROPROPENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,1,1-TRICHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,1,1,2-TETRACHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,1,2-TRICHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,1,2,2-TETRACHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,2-DIBROMO-3-CHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,2-DIBROMOETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,2-DICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,2-DICHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,2-DICHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,2,3-TRICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,2,3-TRICHLOROPROPANE	--	0.25 UJ	--	0.25 UJ	--	0.25 UJ	--	--	--	0.25 U	0.25 U	--
1,2,4-TRICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,2,4-TRIMETHYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,3-DICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,3-DICHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,3,5-TRIMETHYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
1,4-DICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
2-BUTANONE (MEK)	--	5.0 U	--	5.0 U	--	5.0 U	--	--	--	5.0 U	5.0 U	--
2-CHLOROTOLUENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
2-HEXANONE	--	2.5 U	--	2.5 U	--	2.5 U	--	--	--	2.5 U	2.5 U	--
2,2-DICHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
4-CHLOROTOLUENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
4-ISOPROPYLTOLUENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
4-METHYL-2-PENTANONE	--	2.5 U	--	2.5 U	--	2.5 U	--	--	--	2.5 U	2.5 U	--
ACETONE	--	5.0 U	--	5.0 U	--	5.0 U	--	--	--	5.0 U	5.0 U	--
BENZENE	--	0.25 U	--	0.25 U	--	**0.1 J**	--	--	--	**0.1 J**	0.25 U	--
BROMOBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
BROMOCHLOROMETHANE	--	0.5 U	--	0.5 U	--	0.5 U	--	--	--	0.5 U	0.5 U	--
BROMODICHLOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
BROMOFORM	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
CARBON DISULFIDE	--	0.25 U	--	**0.97**	--	0.69	--	--	--	0.25 U	0.25 U	--
CARBON TETRACHLORIDE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
CHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
CHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
CHLOROFORM	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
CHLOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
CIS-1,2-DICHLOROETHENE	--	0.25 U	--	**3.3**	--	**2.7**	--	--	--	**29**	**3.2**	--
CIS-1,3-DICHLOROPROPENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
DIBROMOCHLOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
DIBROMOMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
DICHLORODIFLUOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	**0.18 J**	--
DIISOPROPYL ETHER	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
ETHYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
HEXACHLOROBUTADIENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
ISOPROPYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
METHYL BROMIDE	--	0.59 U	--	0.59 U	--	0.59 U	--	--	--	0.59 U	0.59 U	--
METHYL TERT-BUTYL ETHER	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
METHYLENE CHLORIDE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
N-BUTYL BENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
N-HEXANE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
N-PROPYL BENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
NAPHTHALENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
SEC-BUTYL BENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
STYRENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
TERT-BUTYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-1-C-MW2-1922-F	TS-1-C-MW3-2427	TS-1-C-MW3-2427-F	TS-1-C-MW4-2932	TS-1-C-MW4-2932-F	TS-1-C-MW5-3538	TS-1-C-MW5-3538-F	TS-2-A-1518	TS-2-A-1518-F	TS-2-A-MW1-1518	TS-2-A-MW3-2325	TS-2-A-MW3-2325-F
Sample ID	TS-1-C-MW2-1922-F	TS-1-C-MW3-2427	TS-1-C-MW3-2427-F	TS-1-C-MW4-2932	TS-1-C-MW4-2932-F	TS-1-C-MW5-3538	TS-1-C-MW5-3538-F	TS-2-A-1518	TS-2-A-1518-F	TS-2-A-MW1-1518	TS-2-A-MW3-2325	TS-2-A-MW3-2325-F
Sample Date	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014
Start Depth (feet below ground)	19	24	24	29	29	35	35	15	15	15	23	23
End Depth (feet below ground)	22	27	27	32	32	38	38	18	18	18	25	25
Volatile Organic Compounds (µg/L)												
TETRACHLOROETHENE		0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
TETRAHYDROFURAN		2.5 U	--	2.5 U	--	2.5 U	--	--	--	2.5 U	2.5 U	--
TOLUENE		0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
TRANS-1,2-DICHLOROETHENE		0.25 U	--	0.25 U	--	0.25 U	--	--	--	**0.26 J**	0.25 U	--
TRANS-1,3-DICHLOROPROPENE		0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
TRICHLOROETHYLENE		0.25 U	--	**4.1**	--	**2.6**	--	--	--	**7.0**	**3.9**	--
TRICHLOROFLUOROMETHANE		0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
VINYL CHLORIDE		0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	**0.22 J**	--
XYLENE O		0.25 U	--	0.25 U	--	0.25 U	--	--	--	0.25 U	0.25 U	--
XYLENE P,M		0.5 U	--	0.5 U	--	0.5 U	--	--	--	0.5 U	0.5 U	--
RCRA8 Metals (µg/L)												
Dissolved												
ARSENIC	**2.7 J**	--	**3.9 J**	--	3 U	--	3 U	--	**0.7 J**	--	--	**0.9 J**
BARIUM	**66.7 J**	--	**46.4 J**	--	**41.9 J**	--	**69.3 J**	--	**43.1**	--	--	**32.2**
CADMIUM	**0.57 J**	--	**0.66**	--	0.62 U	--	0.5 U	--	**0.05 J**	--	--	**0.1 J**
CHROMIUM	**2.4 J**	--	6 U	--	6 U	--	**3.6 J**	--	**2.4 J**	--	--	**24.6**
LEAD	3 U	--	3 U	--	3 U	--	3 U	--	1.0 UJ	--	--	**2 J**
MERCURY	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 UJ	--	--	0.2 UJ
SELENIUM	6 U	--	6 U	--	6 U	--	6 U	--	2.0 U	--	--	2.0 U
SILVER	0.3 U	--	0.5 U	--	0.3 U	--	0.3 U	--	0.1 U	--	--	0.1 U
Total												
ARSENIC	--	**4.5 J**	--	**3.3 J**	--	**6.7 J**	--	**2.2 J**	--	--	**5.9**	--
BARIUM	--	**45.9 J**	--	**77.3 J**	--	**128 J**	--	**47.1**	--	--	**130**	--
CADMIUM	--	**0.76**	--	**12.3**	--	**3.18**	--	**0.06 J**	--	--	**0.38 J**	--
CHROMIUM	--	**21.6 J**	--	**317 J**	--	**1050 J**	--	**21.7**	--	--	**317**	--
LEAD	--	3 U	--	**504**	--	**8.7**	--	**2.1 J**	--	--	**21.6 J**	--
MERCURY	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 UJ	--	--	0.2 UJ	--
SELENIUM	--	6 U	--	6 U	--	6 U	--	2.0 U	--	--	2.0 U	--
SILVER	--	0.5 U	--	0.3 U	--	0.3 U	--	0.1 U	--	--	0.1 U	--

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-2-A-MW4-2830		TS-2-A-MW4-2830-F		TS-2-A-MW4-2830-FDUP	TS-2-A-MW4-2830DUP	TS-2-B-MW2-1719	TS-2-B-MW2-1719-F	TS-2-B-MW3-2325	TS-2-B-MW3-2325-F	TS-2-B-MW4-3033	TS-2-B-MW4-3033-F	TS-2-C-MW1-1216
Sample ID	DUP05	TS-2-A-MW4-2830	DUP05-F	TS-2-A-MW4-2830-F	TS-2-A-MW4-2830-FDUP	TS-2-A-MW4-2830DUP	TS-2-B-MW2-1719	TS-2-B-MW2-1719-F	TS-2-B-MW3-2325	TS-2-B-MW3-2325-F	TS-2-B-MW4-3033	TS-2-B-MW4-3033-F	TS-2-C-MW1-1216
Sample Date	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/30/2014	7/30/2014	7/29/2014	7/29/2014	7/31/2014
Start Depth (feet below ground)	28	28	28	28	28	28	17	17	23	23	30	30	12
End Depth (feet below ground)	30	30	30	30	30	30	19	19	25	25	33	33	16
Volatile Organic Compounds (µg/L)													
1,1-DICHLOROETHANE	0.25 U	0.25 U	--	--	--	--	**0.12 J**	--	0.25 U	--	0.25 U	--	**0.53**
1,1-DICHLOROETHENE	0.25 U	0.25 U	--	--	--	--	**2.3**	--	**1.3**	--	0.25 U	--	**4.2**
1,1-DICHLOROPROPENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,1,1-TRICHLOROETHANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,1,1,2-TETRACHLOROETHANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,1,2-TRICHLOROETHANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,1,2,2-TETRACHLOROETHANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2-DIBROMO-3-CHLOROPROPANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2-DIBROMOETHANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2-DICHLOROBENZENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2-DICHLOROETHANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	**30**
1,2-DICHLOROPROPANE	0.25 U	0.25 U	--	--	--	--	**0.47 J**	--	0.25 U	--	0.25 U	--	**24**
1,2,3-TRICHLOROBENZENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2,3-TRICHLOROPROPANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2,4-TRICHLOROBENZENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,2,4-TRIMETHYLBENZENE	**0.16 J**	**0.1 J**	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,3-DICHLOROBENZENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,3-DICHLOROPROPANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,3,5-TRIMETHYLBENZENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
1,4-DICHLOROBENZENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
2-BUTANONE (MEK)	5.0 U	5.0 U	--	--	--	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U
2-CHLOROTOLUENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
2-HEXANONE	2.5 U	2.5 U	--	--	--	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U
2,2-DICHLOROPROPANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
4-CHLOROTOLUENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
4-ISOPROPYLTOLUENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
4-METHYL-2-PENTANONE	2.5 U	2.5 U	--	--	--	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U
ACETONE	5.0 U	5.0 U	--	--	--	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U
BENZENE	0.25 U	0.25 U	--	--	--	--	**0.13 J**	--	**0.09 J**	--	**0.09 J**	--	**0.24 J**
BROMOBENZENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
BROMOCHLOROMETHANE	0.5 U	0.5 U	--	--	--	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U
BROMODICHLOROMETHANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
BROMOFORM	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
CARBON DISULFIDE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
CARBON TETRACHLORIDE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
CHLOROBENZENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
CHLOROETHANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
CHLOROFORM	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
CHLOROMETHANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	**0.3 J**	--	0.25 U	--	0.25 U
CIS-1,2-DICHLOROETHENE	**1.3**	**1.3**	--	--	--	--	**6.8**	--	**6.7**	--	**3.5**	--	**9.3**
CIS-1,3-DICHLOROPROPENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
DIBROMOCHLOROMETHANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
DIBROMOMETHANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
DICHLORODIFLUOROMETHANE	**0.12 J**	**0.11 J**	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
DIISOPROPYL ETHER	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
ETHYLBENZENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
HEXACHLOROBUTADIENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
ISOPROPYLBENZENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
METHYL BROMIDE	0.59 U	0.59 U	--	--	--	--	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U
METHYL TERT-BUTYL ETHER	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
METHYLENE CHLORIDE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
N-BUTYL BENZENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
N-HEXANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
N-PROPYL BENZENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
NAPHTHALENE	0.25 U	**0.81 J**	--	--	--	--	**0.21 J**	--	0.25 U	--	0.25 U	--	0.25 U
SEC-BUTYL BENZENE	0.25 U	**0.15 J**	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
STYRENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
TERT-BUTYLBENZENE	**0.25 J**	**0.29 J**	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-2-A-MW4-2830		TS-2-A-MW4-2830-F		TS-2-A-MW4-2830-FDUP	TS-2-A-MW4-2830DUP	TS-2-B-MW2-1719	TS-2-B-MW2-1719-F	TS-2-B-MW3-2325	TS-2-B-MW3-2325-F	TS-2-B-MW4-3033	TS-2-B-MW4-3033-F	TS-2-C-MW1-1216
Sample ID	DUP05	TS-2-A-MW4-2830	DUP05-F	TS-2-A-MW4-2830-F	TS-2-A-MW4-2830-FDUP	TS-2-A-MW4-2830DUP	TS-2-B-MW2-1719	TS-2-B-MW2-1719-F	TS-2-B-MW3-2325	TS-2-B-MW3-2325-F	TS-2-B-MW4-3033	TS-2-B-MW4-3033-F	TS-2-C-MW1-1216
Sample Date	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/30/2014	7/30/2014	7/29/2014	7/29/2014	7/31/2014
Start Depth (feet below ground)	28	28	28	28	28	28	17	17	23	23	30	30	12
End Depth (feet below ground)	30	30	30	30	30	30	19	19	25	25	33	33	16
Volatile Organic Compounds (µg/L)													
TETRACHLOROETHENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	**0.19 J**
TETRAHYDROFURAN	2.5 U	2.5 U	--	--	--	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U
TOLUENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
TRANS-1,2-DICHLOROETHENE	0.25 U	0.25 U	--	--	--	--	**0.14 J**	--	**0.11 J**	--	0.25 U	--	**0.23 J**
TRANS-1,3-DICHLOROPROPENE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
TRICHLOROETHYLENE	**1.4**	**1.5**	--	--	--	--	**67**	--	**40**	--	**3.9**	--	**140**
TRICHLOROFLUOROMETHANE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
VINYL CHLORIDE	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	**0.18 J**
XYLENE O	0.25 U	0.25 U	--	--	--	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U
XYLENE P,M	0.5 U	0.5 U	--	--	--	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U
RCRA8 Metals (µg/L)													
Dissolved													
ARSENIC	--	--	**0.6 J**	**0.7 J**	**0.8 J**	--	--	1.0 U	--	1.0 U	--	**0.4 J**	--
BARIUM	--	--	**14.9 J**	**14.8 J**	**14.7 J**	--	--	**16.7 J**	--	**25.2**	--	**28.2**	--
CADMIUM	--	--	**0.09 J**	**0.11 J**	**0.11 J**	--	--	**0.17 J**	--	0.1 UJ	--	0.1 UJ	--
CHROMIUM	--	--	**1.7 J**	**1.8 J**	**1.72 J**	--	--	3 U	--	3 U	--	**4.5 J**	--
LEAD	--	--	1.0 UJ	1.0 UJ	1.0 U	--	--	1.0 UJ	--	1.0 U	--	1.0 UJ	--
MERCURY	--	--	0.2 UJ	0.2 UJ	0.2 U	--	--	0.2 UJ	--	0.2 UJ	--	0.2 UJ	--
SELENIUM	--	--	2.0 U	2.0 U	2.0 U	--	--	2.0 U	--	2.0 U	--	2.0 U	--
SILVER	--	--	0.1 U	0.1 U	0.1 U	--	--	0.1 U	--	0.1 UJ	--	0.1 U	--
Total													
ARSENIC	**5.4**	**5.1**	--	--	--	**5.6**	**0.9 J**	--	**6.1**	--	**11.7**	--	**1.4 J**
BARIUM	**65.8**	**57.7**	--	--	--	**67.8**	**23.7 J**	--	**238**	--	**251**	--	**42.5**
CADMIUM	**0.44 J**	**0.35 J**	--	--	--	**0.45 J**	**0.23 J**	--	**0.23 J**	--	**0.14 J**	--	**0.19**
CHROMIUM	**161**	**145**	--	--	--	**170**	**37.7**	--	**563**	--	**652**	--	**18.4**
LEAD	**19 J**	**12.7 J**	--	--	--	**16.5 J**	**2.5 J**	--	**66.2**	--	**66.8 J**	--	**11.7**
MERCURY	0.2 UJ	0.2 UJ	--	--	--	0.2 U	0.2 UJ	--	0.2 UJ	--	0.2 UJ	--	0.2 U
SELENIUM	2.0 U	2.0 U	--	--	--	2.0 U	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U
SILVER	0.1 U	0.1 U	--	--	--	0.1 U	0.1 U	--	0.1 UJ	--	0.1 U	--	0.1 U

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-2-C-MW1-1216-F	TS-2-C-MW2-1921	TS-2-C-MW2-1921-F	TS-2-C-MW3-2426	TS-2-C-MW3-2426-F	TS-2-C-MW4-2933		TS-2-C-MW4-2933-F		TS-2-C-MW6-3739	TS-2-C-MW6-3739-F	TS-2-E-MW1-1215	TS-2-E-MW1-1215-F
Sample ID	TS-2-C-MW1-1216-F	TS-2-C-MW2-1921	TS-2-C-MW2-1921-F	TS-2-C-MW3-2426	TS-2-C-MW3-2426-F	DUP06	TS-2-C-MW4-2933	DUP06-F	TS-2-C-MW4-2933-F	TS-2-C-MW6-3739	TS-2-C-MW6-3739-F	TS-2-E-MW1-1215	TS-2-E-MW1-1215-F
Sample Date	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/30/2014	7/30/2014	7/31/2014	7/31/2014
Start Depth (feet below ground)	12	19	19	24	24	29	29	29	29	37	37	12	12
End Depth (feet below ground)	16	21	21	26	26	33	33	33	33	39	39	15	15
Volatile Organic Compounds (µg/L)													
1,1-DICHLOROETHANE	--	**0.26 J**	--	**0.37 J**	--	**0.38 J**	**0.34 J**	--	--	**0.45 J**	--	0.25 U	--
1,1-DICHLOROETHENE	--	**1.2**	--	**0.9**	--	**0.86**	**0.79**	--	--	**0.9**	--	0.25 U	--
1,1-DICHLOROPROPENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,1,1-TRICHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,1,1,2-TETRACHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,1,2-TRICHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,1,2,2-TETRACHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,2-DIBROMO-3-CHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,2-DIBROMOETHANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,2-DICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,2-DICHLOROETHANE	--	**2.2**	--	0.25 U	--	**0.55**	**0.52**	--	--	**0.54**	--	0.25 U	--
1,2-DICHLOROPROPANE	--	**2.1**	--	**0.43 J**	--	**0.68**	**0.63**	--	--	**0.73**	--	0.25 U	--
1,2,3-TRICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,2,3-TRICHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,2,4-TRICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,2,4-TRIMETHYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,3-DICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,3-DICHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,3,5-TRIMETHYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
1,4-DICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
2-BUTANONE (MEK)	--	5.0 U	--	5.0 U	--	5.0 U	5.0 U	--	--	5.0 U	--	5.0 U	--
2-CHLOROTOLUENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
2-HEXANONE	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U	--	--	2.5 U	--	2.5 U	--
2,2-DICHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
4-CHLOROTOLUENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
4-ISOPROPYLTOLUENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
4-METHYL-2-PENTANONE	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U	--	--	2.5 U	--	2.5 U	--
ACETONE	--	5.0 U	--	5.0 U	--	5.0 U	5.0 U	--	--	5.0 U	--	5.0 U	--
BENZENE	--	**0.18 J**	--	**0.11 J**	--	**0.11 J**	**0.1 J**	--	--	**0.14 J**	--	0.25 U	--
BROMOBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
BROMOCHLOROMETHANE	--	0.5 U	--	0.5 U	--	0.5 U	0.5 U	--	--	0.5 U	--	0.5 U	--
BROMODICHLOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
BROMOFORM	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
CARBON DISULFIDE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
CARBON TETRACHLORIDE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
CHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
CHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
CHLOROFORM	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
CHLOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
CIS-1,2-DICHLOROETHENE	--	**17**	--	**27**	--	**23**	**24**	--	--	**28**	--	**0.12 J**	--
CIS-1,3-DICHLOROPROPENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
DIBROMOCHLOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
DIBROMOMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
DICHLORODIFLUOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
DIISOPROPYL ETHER	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
ETHYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
HEXACHLOROBUTADIENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
ISOPROPYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
METHYL BROMIDE	--	0.59 U	--	0.59 U	--	0.59 U	0.59 U	--	--	0.59 U	--	0.59 U	--
METHYL TERT-BUTYL ETHER	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
METHYLENE CHLORIDE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
N-BUTYL BENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
N-HEXANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
N-PROPYL BENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
NAPHTHALENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
SEC-BUTYL BENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
STYRENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
TERT-BUTYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-2-C-MW1-1216-F	TS-2-C-MW2-1921	TS-2-C-MW2-1921-F	TS-2-C-MW3-2426	TS-2-C-MW3-2426-F	TS-2-C-MW4-2933		TS-2-C-MW4-2933-F		TS-2-C-MW6-3739	TS-2-C-MW6-3739-F	TS-2-E-MW1-1215	TS-2-E-MW1-1215-F
Sample ID	TS-2-C-MW1-1216-F	TS-2-C-MW2-1921	TS-2-C-MW2-1921-F	TS-2-C-MW3-2426	TS-2-C-MW3-2426-F	DUP06	TS-2-C-MW4-2933	DUP06-F	TS-2-C-MW4-2933-F	TS-2-C-MW6-3739	TS-2-C-MW6-3739-F	TS-2-E-MW1-1215	TS-2-E-MW1-1215-F
Sample Date	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/30/2014	7/30/2014	7/31/2014	7/31/2014
Start Depth (feet below ground)	12	19	19	24	24	29	29	29	29	37	37	12	12
End Depth (feet below ground)	16	21	21	26	26	33	33	33	33	39	39	15	15
Volatile Organic Compounds (µg/L)													
TETRACHLOROETHENE	--	0.25 U	--	**0.26 J**	--	**0.2 J**	**0.24 J**	--	--	**0.27 J**	--	0.25 U	--
TETRAHYDROFURAN	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U	--	--	2.5 U	--	2.5 U	--
TOLUENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
TRANS-1,2-DICHLOROETHENE	--	**0.28 J**	--	**0.49 J**	--	**0.27 J**	**0.24 J**	--	--	**0.33 J**	--	0.25 U	--
TRANS-1,3-DICHLOROPROPENE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
TRICHLOROETHYLENE	--	**130**	--	**84**	--	**53**	**49**	--	--	**66**	--	**0.25 J**	--
TRICHLOROFLUOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
VINYL CHLORIDE	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
XYLENE O	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--	0.25 U	--	0.25 U	--
XYLENE P,M	--	0.5 U	--	0.5 U	--	0.5 U	0.5 U	--	--	0.5 U	--	0.5 U	--
RCRA8 Metals (µg/L)													
Dissolved													
ARSENIC	1.0 U	--	1.0 U	--	1.0 U	--	--	1.0 U	1.0 U	--	1.0 U	--	1.0 U
BARIUM	**12 J**	--	**15.9 J**	--	**18.8 J**	--	--	36.4	33.1	--	**19.4 J**	--	**10.3 J**
CADMIUM	**0.06 J**	--	**0.04 J**	--	0.1 U	--	--	0.1 U	0.1 U	--	0.1 UJ	--	**0.09 J**
CHROMIUM	3 U	--	3 U	--	**4.6 J**	--	--	3 U	3 U	--	3 U	--	3 U
LEAD	1.0 U	--	**0.7 J**	--	**0.7 J**	--	--	1.0 U	1.0 U	--	1.0 U	--	1.0 U
MERCURY	0.2 U	--	0.2 U	--	0.2 U	--	--	0.2 U	0.2 U	--	0.2 UJ	--	0.2 U
SELENIUM	2.0 U	--	2.0 U	--	2.0 U	--	--	2.0 U	2.0 U	--	2.0 U	--	2.0 U
SILVER	0.1 U	--	0.1 U	--	0.1 U	--	--	0.1 U	**0.22 J**	--	0.1 UJ	--	0.1 U
Total													
ARSENIC	--	**1.2 J**	--	1.0 U	--	**1.9 J**	**2.2 J**	--	--	**3.3**	--	**5.1**	--
BARIUM	--	**287**	--	**21.1 J**	--	**123**	**128**	--	--	**210**	--	**200**	--
CADMIUM	--	**0.74**	--	**0.06 J**	--	**0.36**	**0.38**	--	--	**0.19 J**	--	**0.3**	--
CHROMIUM	--	**24.9**	--	3 U	--	**42.6**	**43.6**	--	--	**410**	--	**130**	--
LEAD	--	**15.8**	--	1.0 U	--	**24.2**	**24.9**	--	--	**32.3**	--	**16.7**	--
MERCURY	--	0.2 U	--	0.2 U	--	0.2 U	0.2 U	--	--	0.2 UJ	--	0.2 U	--
SELENIUM	--	2.0 U	--	2.0 U	--	2.0 U	2.0 U	--	--	2.0 U	--	**0.8 J**	--
SILVER	--	0.1 U	--	0.1 U	--	**0.1 J**	**0.12 J**	--	--	**0.13 J**	--	0.1 U	--

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-2-E-MW2-1720	TS-2-E-MW2-1720-F	TS-2-E-MW3-2427	TS-2-E-MW3-2427-F	TS-2-E-MW5-3033	TS-2-E-MW5-3033-F	TS-2-E-MW6-3740	TS-2-E-MW6-3740-F	TS-2-F-MW1-1316	TS-2-F-MW1-1316-F	TS-2-F-MW2-1922	
Sample ID	TS-2-E-MW2-1720	TS-2-E-MW2-1720-F	TS-2-E-MW3-2427	TS-2-E-MW3-2427-F	TS-2-E-MW5-3033	TS-2-E-MW5-3033-F	TS-2-E-MW6-3740	TS-2-E-MW6-3740-F	TS-2-F-MW1-1316	TS-2-F-MW1-1316-F	DUP07	TS-2-F-MW2-1922
Sample Date	7/31/2014	7/31/2014	7/31/2014	7/31/2014	8/1/2014	8/1/2014	7/31/2014	7/31/2014	8/1/2014	8/1/2014	8/1/2014	8/1/2014
Start Depth (feet below ground)	17	17	24	24	30	30	37	37	13	13	19	19
End Depth (feet below ground)	20	20	27	27	33	33	40	40	16	16	22	22
Volatile Organic Compounds (µg/L)												
1,1-DICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	**0.50**	--	0.25 U	--	0.25 U	0.25 U
1,1-DICHLOROETHENE	0.25 U	--	0.25 U	--	0.25 U	--	**0.88**	--	0.25 U	--	0.25 U	0.25 U
1,1-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,1,1-TRICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,1,1,2-TETRACHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,1,2-TRICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,1,2,2-TETRACHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2-DIBROMO-3-CHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2-DIBROMOETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2-DICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2-DICHLOROPROPANE	0.25 U	--	0.25 U	--	**0.2 J**	--	**0.49 J**	--	0.25 U	--	0.25 U	0.25 U
1,2,3-TRICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2,3-TRICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2,4-TRICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,2,4-TRIMETHYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,3-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,3-DICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,3,5-TRIMETHYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
1,4-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
2-BUTANONE (MEK)	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	5.0 U
2-CHLOROTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
2-HEXANONE	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U
2,2-DICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
4-CHLOROTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
4-ISOPROPYLTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
4-METHYL-2-PENTANONE	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U
ACETONE	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	5.0 U
BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	**0.22 J**	--	0.25 U	--	0.25 U	0.25 U
BROMOBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
BROMOCHLOROMETHANE	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	0.5 U
BROMODICHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
BROMOFORM	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CARBON DISULFIDE	**0.98**	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CARBON TETRACHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CHLOROFORM	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CHLOROMETHANE	0.25 U	--	0.25 U	--	**0.25 J**	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
CIS-1,2-DICHLOROETHENE	**0.56**	--	**0.7**	--	**4.1**	--	**37**	--	0.25 U	--	**1.4**	**1.4**
CIS-1,3-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
DIBROMOCHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
DIBROMOMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
DICHLORODIFLUOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
DIISOPROPYL ETHER	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
ETHYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
HEXACHLOROBUTADIENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
ISOPROPYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
METHYL BROMIDE	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	0.59 U
METHYL TERT-BUTYL ETHER	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
METHYLENE CHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
N-BUTYL BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
N-HEXANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
N-PROPYL BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
NAPHTHALENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
SEC-BUTYL BENZENE	**0.7**	--	**0.61**	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
STYRENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
TERT-BUTYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-2-E-MW2-1720	TS-2-E-MW2-1720-F	TS-2-E-MW3-2427	TS-2-E-MW3-2427-F	TS-2-E-MW5-3033	TS-2-E-MW5-3033-F	TS-2-E-MW6-3740	TS-2-E-MW6-3740-F	TS-2-F-MW1-1316	TS-2-F-MW1-1316-F	TS-2-F-MW2-1922	
Sample ID	TS-2-E-MW2-1720	TS-2-E-MW2-1720-F	TS-2-E-MW3-2427	TS-2-E-MW3-2427-F	TS-2-E-MW5-3033	TS-2-E-MW5-3033-F	TS-2-E-MW6-3740	TS-2-E-MW6-3740-F	TS-2-F-MW1-1316	TS-2-F-MW1-1316-F	DUP07	TS-2-F-MW2-1922
Sample Date	7/31/2014	7/31/2014	7/31/2014	7/31/2014	8/1/2014	8/1/2014	7/31/2014	7/31/2014	8/1/2014	8/1/2014	8/1/2014	8/1/2014
Start Depth (feet below ground)	17	17	24	24	30	30	37	37	13	13	19	19
End Depth (feet below ground)	20	20	27	27	33	33	40	40	16	16	22	22
Volatile Organic Compounds (µg/L)												
TETRACHLOROETHENE	0.25 U	--	**0.21 J**	--	**0.82**	--	0.25 U	--	0.25 U	--	**0.09 J**	**0.1 J**
TETRAHYDROFURAN	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U
TOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
TRANS-1,2-DICHLOROETHENE	0.25 U	--	0.25 U	--	0.25 U	--	**0.27 J**	--	0.25 U	--	0.25 U	0.25 U
TRANS-1,3-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
TRICHLOROETHYLENE	**0.49 J**	--	**6.8**	--	**35**	--	**98**	--	**0.15 J**	--	**2.4**	**2.4**
TRICHLOROFLUOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
VINYL CHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	**0.17 J**	0.25 U
XYLENE O	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U
XYLENE P,M	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	0.5 U
RCRA8 Metals (µg/L)												
Dissolved												
ARSENIC	--	1.0 U	--	1.0 U	--	1.0 UJ	--	1.0 U	--	1.0 UJ	--	--
BARIUM	--	**12.8 J**	--	**8.8 J**	--	**4.7 J**	--	**16 J**	--	**19.3 J**	--	--
CADMIUM	--	**0.1 J**	--	**0.08 J**	--	**0.08 J**	--	**0.06 J**	--	**0.13 J**	--	--
CHROMIUM	--	3 U	--	3 U	--	3 UJ	--	3 U	--	3 UJ	--	--
LEAD	--	1.0 U	--	1.0 U	--	1.0 UJ	--	**0.5 J**	--	1.0 UJ	--	--
MERCURY	--	0.2 U	--	0.2 U	--	0.2 UJ	--	0.2 U	--	0.2 UJ	--	--
SELENIUM	--	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--	--
SILVER	--	0.1 U	--	0.1 U	--	0.1 UJ	--	0.1 U	--	0.1 UJ	--	--
Total												
ARSENIC	**3.8**	--	**10.4**	--	**5.3 J**	--	**7**	--	**1.1 J**	--	**5.4 J**	**6.4 J**
BARIUM	**151**	--	**542**	--	**679 J**	--	**365**	--	**37.8 J**	--	**538 J**	**596 J**
CADMIUM	**0.33**	--	**1.32**	--	**1.75 J**	--	**0.95**	--	**0.15 J**	--	**2.14 J**	**2.7 J**
CHROMIUM	**88.1**	--	**635**	--	**246 J**	--	**890**	--	**31.2 J**	--	**97.0 J**	**122 J**
LEAD	**14.8**	--	**103**	--	**196 J**	--	**61.3**	--	**3.2 J**	--	**98.9 J**	**134 J**
MERCURY	0.2 U	--	0.2 U	--	0.2 UJ	--	0.2 U	--	0.2 UJ	--	0.2 UJ	0.2 UJ
SELENIUM	2.0 U	--	**0.9 J**	--	**0.7 J**	--	2.0 U	--	2.0 U	--	**0.8 J**	**1.2 J**
SILVER	0.1 U	--	0.1 U	--	0.1 UJ	--	0.1 U	--	0.1 UJ	--	0.1 UJ	0.1 UJ

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-2-F-MW2-1922-F		TS-2-F-MW2-1922-FDUP	TS-2-F-MW2-1922DUP	TS-2-G-MW1-1316	TS-2-G-MW2-1720	TS-2-G-MW3-2325	TS-2-G-MW3-2325-F	TS-2-G-MW4-2831	TS-2-G-MW4-2831-F	TS-2-H-MW1-1315	TS-2-H-MW1-1315-F
Sample ID	DUP07-F	TS-2-F-MW2-1922-F	TS-2-F-MW2-1922-FDUP	TS-2-F-MW2-1922DUP	TS-2-G-MW1-1316	TS-2-G-MW2-1720	TS-2-G-MW3-2325	TS-2-G-MW3-2325-F	TS-2-G-MW4-2831	TS-2-G-MW4-2831-F	TS-2-H-MW1-1315	TS-2-H-MW1-1315-F
Sample Date	8/1/2014	8/1/2014	8/1/2014	8/1/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	8/4/2014	8/4/2014
Start Depth (feet below ground)	19	19	19	19	13	17	23	23	28	28	13	13
End Depth (feet below ground)	22	22	22	22	16	20	25	25	31	31	15	15
Volatile Organic Compounds (µg/L)												
1,1-DICHLOROETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,1-DICHLOROETHENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	**0.22 J**	--	0.25 U	--
1,1-DICHLOROPROPENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,1,1-TRICHLOROETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,1,1,2-TETRACHLOROETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,1,2-TRICHLOROETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,1,2,2-TETRACHLOROETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DIBROMO-3-CHLOROPROPANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DIBROMOETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DICHLOROBENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DICHLOROETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DICHLOROPROPANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,2,3-TRICHLOROBENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,2,3-TRICHLOROPROPANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,2,4-TRICHLOROBENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,2,4-TRIMETHYLBENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,3-DICHLOROBENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,3-DICHLOROPROPANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,3,5-TRIMETHYLBENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
1,4-DICHLOROBENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
2-BUTANONE (MEK)	--	--	--	--	5.0 U	5.0 U	5.0 U	--	5.0 U	--	5.0 U	--
2-CHLOROTOLUENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
2-HEXANONE	--	--	--	--	2.5 U	2.5 U	2.5 U	--	2.5 U	--	2.5 U	--
2,2-DICHLOROPROPANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
4-CHLOROTOLUENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
4-ISOPROPYLTOLUENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
4-METHYL-2-PENTANONE	--	--	--	--	2.5 U	2.5 U	2.5 U	--	2.5 U	--	2.5 U	--
ACETONE	--	--	--	--	5.0 U	5.0 U	5.0 U	--	5.0 U	--	5.0 U	--
BENZENE	--	--	--	--	**0.56**	**0.33 J**	0.25 U	--	0.25 U	--	**0.3 J**	--
BROMOBENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
BROMOCHLOROMETHANE	--	--	--	--	0.5 U	0.5 U	0.5 U	--	0.5 U	--	0.5 U	--
BROMODICHLOROMETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
BROMOFORM	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
CARBON DISULFIDE	--	--	--	--	**0.56**	**0.62**	**0.27 J**	--	0.25 U	--	**0.71**	--
CARBON TETRACHLORIDE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
CHLOROBENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
CHLOROETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
CHLOROFORM	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
CHLOROMETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	**0.24 J**	--	0.25 U	--
CIS-1,2-DICHLOROETHENE	--	--	--	--	**72**	**37**	**2.7**	--	**2.8**	--	0.25 U	--
CIS-1,3-DICHLOROPROPENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
DIBROMOCHLOROMETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
DIBROMOMETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
DICHLORODIFLUOROMETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
DIISOPROPYL ETHER	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
ETHYLBENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
HEXACHLOROBUTADIENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
ISOPROPYLBENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
METHYL BROMIDE	--	--	--	--	0.59 U	0.59 U	0.59 U	--	0.59 U	--	0.59 U	--
METHYL TERT-BUTYL ETHER	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
METHYLENE CHLORIDE	--	--	--	--	**0.34 J**	**0.22 J**	0.25 U	--	0.25 U	--	0.25 U	--
N-BUTYL BENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
N-HEXANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
N-PROPYL BENZENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
NAPHTHALENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
SEC-BUTYL BENZENE	--	--	--	--	0.25 U	0.25 U	**0.21 J**	--	**0.13 J**	--	0.25 U	--
STYRENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
TERT-BUTYLBENZENE	--	--	--	--	0.25 U	0.25 U	**0.25 J**	--	0.25 U	--	0.25 U	--

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-2-F-MW2-1922-F		TS-2-F-MW2-1922-FDUP	TS-2-F-MW2-1922DUP	TS-2-G-MW1-1316	TS-2-G-MW2-1720	TS-2-G-MW3-2325	TS-2-G-MW3-2325-F	TS-2-G-MW4-2831	TS-2-G-MW4-2831-F	TS-2-H-MW1-1315	TS-2-H-MW1-1315-F
Sample ID	DUP07-F	TS-2-F-MW2-1922-F	TS-2-F-MW2-1922-FDUP	TS-2-F-MW2-1922DUP	TS-2-G-MW1-1316	TS-2-G-MW2-1720	TS-2-G-MW3-2325	TS-2-G-MW3-2325-F	TS-2-G-MW4-2831	TS-2-G-MW4-2831-F	TS-2-H-MW1-1315	TS-2-H-MW1-1315-F
Sample Date	8/1/2014	8/1/2014	8/1/2014	8/1/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	8/4/2014	8/4/2014
Start Depth (feet below ground)	19	19	19	19	13	17	23	23	28	28	13	13
End Depth (feet below ground)	22	22	22	22	16	20	25	25	31	31	15	15
Volatile Organic Compounds (µg/L)												
TETRACHLOROETHENE	--	--	--	--	0.25 U	0.25 U	**0.15 J**	--	0.25 U	--	0.25 U	--
TETRAHYDROFURAN	--	--	--	--	2.5 U	2.5 U	2.5 U	--	2.5 U	--	2.5 U	--
TOLUENE	--	--	--	--	**0.15 J**	**0.12 J**	0.25 U	--	**0.09 J**	--	**0.13 J**	--
TRANS-1,2-DICHLOROETHENE	--	--	--	--	**0.2 J**	**0.32 J**	0.25 U	--	0.25 U	--	0.25 U	--
TRANS-1,3-DICHLOROPROPENE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
TRICHLOROETHYLENE	--	--	--	--	**110**	**77**	**10**	--	**6.2**	--	**0.53**	--
TRICHLOROFLUOROMETHANE	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
VINYL CHLORIDE	--	--	--	--	**0.43 J**	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
XYLENE O	--	--	--	--	0.25 U	0.25 U	0.25 U	--	0.25 U	--	0.25 U	--
XYLENE P,M	--	--	--	--	0.5 U	0.5 U	0.5 U	--	0.5 U	--	0.5 U	--
RCRA8 Metals (µg/L)												
Dissolved												
ARSENIC	1.0 UJ	**0.4 J**	--	--	--	--	--	1.0 U	--	1.0 U	--	1.0 U
BARIUM	**3.9 J**	**3.7 J**	--	--	--	--	--	**17.6 J**	--	**17.5 J**	--	**30.9**
CADMIUM	**0.1 J**	**0.09 J**	--	--	--	--	--	**0.04 J**	--	0.1 UJ	--	0.5 U
CHROMIUM	3 UJ	3 UJ	--	--	--	--	--	3 U	--	**2.9 J**	--	3 U
LEAD	1.0 UJ	1.0 UJ	--	--	--	--	--	**9.1**	--	1.0 U	--	**5.1 J**
MERCURY	0.2 UJ	0.2 UJ	--	--	--	--	--	0.2 UJ	--	0.2 UJ	--	0.2 U
SELENIUM	2.0 U	2.0 U	--	--	--	--	--	2.0 U	--	2.0 U	--	2.0 U
SILVER	0.1 UJ	0.1 UJ	--	--	--	--	--	0.1 UJ	--	0.1 UJ	--	0.3 U
Total												
ARSENIC	--	--	1.0 UJ	**5.8**	--	--	**1.5 J**	--	**5.5**	--	**0.9 J**	--
BARIUM	--	--	**3.82 J**	**576**	--	--	**70.5**	--	**208**	--	**38.4**	--
CADMIUM	--	--	**0.09 J**	**2.43**	--	--	**0.36 J**	--	**0.63 J**	--	0.5 U	--
CHROMIUM	--	--	3 U	**114**	--	--	**107**	--	**711**	--	**8 J**	--
LEAD	--	--	1.0 U	**108 J**	--	--	**21.5**	--	**48.2**	--	**6.8 J**	--
MERCURY	--	--	0.2 U	0.2 U	--	--	0.2 UJ	--	0.2 UJ	--	0.2 U	--
SELENIUM	--	--	2.0 U	**1 J**	--	--	2.0 U	--	2.0 U	--	2.0 U	--
SILVER	--	--	0.1 U	0.1 U	--	--	0.1 UJ	--	0.1 UJ	--	0.5 U	--

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-2-H-MW2-1820	TS-2-H-MW2-1820-F	TS-2-H-MW3-2225	TS-2-H-MW3-2225-F	TS-2-H-MW4-2730	TS-2-H-MW4-2730-F	TS-3-A-MW2-1720	TS-3-A-MW2-1720-F	TS-3-A-MW3-2225	TS-3-A-MW3-2225-F	TS-3-A-MW4-2830	TS-3-A-MW4-2830-F
Sample ID	TS-2-H-MW2-1820	TS-2-H-MW2-1820-F	TS-2-H-MW3-2225	TS-2-H-MW3-2225-F	TS-2-H-MW4-2730	TS-2-H-MW4-2730-F	TS-3-A-MW2-1720	TS-3-A-MW2-1720-F	TS-3-A-MW3-2225	TS-3-A-MW3-2225-F	TS-3-A-MW4-2830	TS-3-A-MW4-2830-F
Sample Date	8/4/2014	8/4/2014	8/1/2014	8/1/2014	8/1/2014	8/1/2014	7/21/2014	7/21/2014	7/21/2014	7/21/2014	7/21/2014	7/21/2014
Start Depth (feet below ground)	18	18	22	22	27	27	17	17	22	22	28	28
End Depth (feet below ground)	20	20	25	25	30	30	20	20	25	25	30	30
Volatile Organic Compounds (µg/L)												
1,1-DICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,1-DICHLOROETHENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,1-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,1,1-TRICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,1,1,2-TETRACHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,1,2-TRICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	**0.37 J**	--
1,1,2,2-TETRACHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.5 U	--
1,2-DIBROMO-3-CHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DIBROMOETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	**0.22 J**	--
1,2-DICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2,3-TRICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2,3-TRICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2,4-TRICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	**0.28 J**	--
1,2,4-TRIMETHYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	**11**	--	0.25 U	--	0.25 U	--
1,3-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,3-DICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
1,3,5-TRIMETHYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	**4.2**	--	0.25 U	--	**0.11 J**	--
1,4-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
2-BUTANONE (MEK)	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--
2-CHLOROTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
2-HEXANONE	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--
2,2-DICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
4-CHLOROTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
4-ISOPROPYLTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	**0.87**	--	0.25 U	--	0.25 U	--
4-METHYL-2-PENTANONE	2.5 U	--	2.5 U	--	2.5 U	--	2.5 UJ	--	2.5 UJ	--	2.5 UJ	--
ACETONE	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--
BENZENE	**0.32 J**	--	**0.12 J**	--	**0.15 J**	--	**0.28 J**	--	0.25 U	--	**0.15 J**	--
BROMOBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
BROMOCHLOROMETHANE	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	--
BROMODICHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
BROMOFORM	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
CARBON DISULFIDE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	**1**	--
CARBON TETRACHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
CHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
CHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
CHLOROFORM	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
CHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
CIS-1,2-DICHLOROETHENE	**0.11 J**	--	0.25 U	--	0.25 U	--	**9.5**	--	0.25 U	--	**0.13 J**	--
CIS-1,3-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
DIBROMOCHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
DIBROMOMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
DICHLORODIFLUOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	**1.2**	--	0.25 U	--	0.25 U	--
DIISOPROPYL ETHER	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
ETHYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	**7.5**	--	**0.08 J**	--	0.25 U	--
HEXACHLOROBUTADIENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
ISOPROPYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	**4**	--	0.25 U	--	0.25 U	--
METHYL BROMIDE	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	--
METHYL TERT-BUTYL ETHER	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
METHYLENE CHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	**0.16 J**	--	0.25 U	--	**0.17 J**	--
N-BUTYL BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
N-HEXANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
N-PROPYL BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	**2.3**	--	0.25 U	--	0.25 U	--
NAPHTHALENE	0.25 U	--	0.25 U	--	0.25 U	--	**780**	--	0.25 U	--	**1 J**	--
SEC-BUTYL BENZENE	0.25 U	--	**0.16 J**	--	0.25 U	--	0.25 U	--	**3.4**	--	0.25 U	--
STYRENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
TERT-BUTYLBENZENE	**0.24 J**	--	**0.81**	--	0.25 U	--	**0.44 J**	--	**1.2**	--	**0.27 J**	--

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-2-H-MW2-1820	TS-2-H-MW2-1820-F	TS-2-H-MW3-2225	TS-2-H-MW3-2225-F	TS-2-H-MW4-2730	TS-2-H-MW4-2730-F	TS-3-A-MW2-1720	TS-3-A-MW2-1720-F	TS-3-A-MW3-2225	TS-3-A-MW3-2225-F	TS-3-A-MW4-2830	TS-3-A-MW4-2830-F
Sample ID	TS-2-H-MW2-1820	TS-2-H-MW2-1820-F	TS-2-H-MW3-2225	TS-2-H-MW3-2225-F	TS-2-H-MW4-2730	TS-2-H-MW4-2730-F	TS-3-A-MW2-1720	TS-3-A-MW2-1720-F	TS-3-A-MW3-2225	TS-3-A-MW3-2225-F	TS-3-A-MW4-2830	TS-3-A-MW4-2830-F
Sample Date	8/4/2014	8/4/2014	8/1/2014	8/1/2014	8/1/2014	8/1/2014	7/21/2014	7/21/2014	7/21/2014	7/21/2014	7/21/2014	7/21/2014
Start Depth (feet below ground)	18	18	22	22	27	27	17	17	22	22	28	28
End Depth (feet below ground)	20	20	25	25	30	30	20	20	25	25	30	30
Volatile Organic Compounds (µg/L)												
TETRACHLOROETHENE	0.25 U	--	0.25 U	--	0.25 U	--	**1.5**	--	**0.14 J**	--	**0.14 J**	--
TETRAHYDROFURAN	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	--
TOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	**1**	--	**0.09 J**	--	**0.14 J**	--
TRANS-1,2-DICHLOROETHENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
TRANS-1,3-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
TRICHLOROETHYLENE	**1.6**	--	**0.77**	--	**0.28 J**	--	**12**	--	**0.11 J**	--	**0.49 J**	--
TRICHLOROFLUOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	--
VINYL CHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	**2**	--	0.25 U	--	0.25 U	--
XYLENE O	0.25 U	--	0.25 U	--	0.25 U	--	**12**	--	0.25 U	--	0.25 U	--
XYLENE P,M	0.5 U	--	0.5 U	--	0.5 U	--	**8.5**	--	**0.11 J**	--	**0.13 J**	--
RCRA8 Metals (µg/L)												
Dissolved												
ARSENIC	--	1.0 U	--	**0.5 J**	--	**0.4 J**	--	1.0 U	--	**8.1 J**	--	**1.6 J**
BARIUM	--	**24.1 J**	--	**34.7 J**	--	**21.5 J**	--	**18.5 J**	--	**3.7 J**	--	100
CADMIUM	--	0.5 U	--	0.1 U	--	0.1 U	--	0.1 U	--	0.12 U	--	**0.69**
CHROMIUM	--	3 U	--	3 UJ	--	3 UJ	--	3 U	--	3 U	--	**13.2**
LEAD	--	1.0 UJ	--	**1.1 J**	--	**1.4 J**	--	1.0 U	--	1.0 U	--	**40.2**
MERCURY	--	0.2 U	--	0.2 UJ	--	0.2 UJ	--	0.2 U	--	0.2 U	--	0.2 U
SELENIUM	--	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U
SILVER	--	0.3 U	--	0.1 UJ	--	0.1 UJ	--	0.1 U	--	0.1 U	--	0.1 U
Total												
ARSENIC	1.0 U	--	**2.9 J**	--	**2.0 J**	--	0.7 J	--	**10.8 J**	--	**3.6 J**	--
BARIUM	**30.8**	--	**309 J**	--	**77.3 J**	--	9.9 J	--	**587**	--	**377**	--
CADMIUM	0.5 U	--	**0.47 J**	--	**0.82 J**	--	0.1 U	--	**4.81**	--	**2.84**	--
CHROMIUM	**5.8 J**	--	**148 J**	--	**96.9 J**	--	3 U	--	**63.3**	--	**63.5**	--
LEAD	**3.2 J**	--	**15.4 J**	--	**19.1 J**	--	1.0 U	--	**229**	--	**145**	--
MERCURY	0.2 U	--	0.2 UJ	--	0.2 UJ	--	0.2 U	--	0.2 U	--	0.2 U	--
SELENIUM	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--
SILVER	0.3 U	--	0.1 UJ	--	0.1 UJ	--	0.1 U	--	0.1 U	--	0.1 U	--

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-3-B-MW1-1517	TS-3-B-MW1-1517-F	TS-3-B-MW3-2526	TS-3-B-MW3-2526-F	TS-3-B-MW4-3031	TS-3-B-MW4-3031-F	TS-3-B-MW6-3940			TS-3-B-MW6-3940-F		TS-3-C-MW1-1415	TS-3-C-MW1-1415-F
Sample ID	TS-3-B-MW1-1517	TS-3-B-MW1-1517-F	TS-3-B-MW3-2526	TS-3-B-MW3-2526-F	TS-3-B-MW4-3031	TS-3-B-MW4-3031-F	Dup 01	DUP01	TS-3-B-MW6-3940	Dup 01-F	TS-3-B-MW6-3940-F	TS-3-C-MW1-1415	TS-3-C-MW1-1415-F
Sample Date	7/21/2014	7/21/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014	7/21/2014	7/21/2014	7/21/2014	7/21/2014	7/21/2014	7/22/2014	7/22/2014
Start Depth (feet below ground)	15	15	25	25	30	30	39	39	39	39	39	14	14
End Depth (feet below ground)	17	17	26	26	31	31	40	40	40	40	40	15	15
Volatile Organic Compounds (µg/L)													
1,1-DICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	**0.13 J**	--
1,1-DICHLOROETHENE	0.25 U	--	**0.14 J**	--	0.25 U	--	--	**0.26 J**	**0.22 J**	--	--	0.25 U	--
1,1-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,1,1-TRICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	**0.17 J**	--
1,1,1,2-TETRACHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,1,2-TRICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,1,2,2-TETRACHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,2-DIBROMO-3-CHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,2-DIBROMOETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,2-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,2-DICHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,2-DICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,2,3-TRICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,2,3-TRICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,2,4-TRICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,2,4-TRIMETHYLBENZENE	**0.08 J**	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,3-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,3-DICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,3,5-TRIMETHYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
1,4-DICHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
2-BUTANONE (MEK)	5.0 U	--	5.0 U	--	5.0 U	--	--	5.0 U	5.0 U	--	--	5.0 U	--
2-CHLOROTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
2-HEXANONE	2.5 U	--	2.5 U	--	2.5 U	--	--	2.5 U	2.5 U	--	--	2.5 U	--
2,2-DICHLOROPROPANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
4-CHLOROTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
4-ISOPROPYLTOLUENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
4-METHYL-2-PENTANONE	2.5 UJ	--	2.5 U	--	2.5 U	--	--	2.5 UJ	2.5 UJ	--	--	2.5 U	--
ACETONE	5.0 U	--	5.0 U	--	5.0 U	--	--	5.0 U	5.0 U	--	--	5.0 U	--
BENZENE	0.25 U	--	0.25 U	--	**0.1 J**	--	--	0.25 U	0.25 U	--	--	0.25 U	--
BROMOBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
BROMOCHLOROMETHANE	0.5 U	--	0.5 U	--	0.5 U	--	--	0.5 U	0.5 U	--	--	0.5 U	--
BROMODICHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
BROMOFORM	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
CARBON DISULFIDE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
CARBON TETRACHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
CHLOROBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
CHLOROETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
CHLOROFORM	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	**0.13 J**	--
CHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
CIS-1,2-DICHLOROETHENE	**2.3**	--	**1.5**	--	**0.38 J**	--	--	**0.89**	**0.9**	--	--	**1.7**	--
CIS-1,3-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
DIBROMOCHLOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
DIBROMOMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
DICHLORODIFLUOROMETHANE	**2.9**	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
DIISOPROPYL ETHER	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
ETHYLBENZENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
HEXACHLOROBUTADIENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
ISOPROPYLBENZENE	0.25 U	--	**0.18 J**	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
METHYL BROMIDE	0.59 U	--	0.59 U	--	0.59 U	--	--	0.59 U	0.59 U	--	--	0.59 U	--
METHYL TERT-BUTYL ETHER	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
METHYLENE CHLORIDE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
N-BUTYL BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
N-HEXANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
N-PROPYL BENZENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
NAPHTHALENE	**0.65 J**	--	**0.2 J**	--	**0.97 J**	--	--	**1.1 J**	**1.8 J**	--	--	0.25 U	--
SEC-BUTYL BENZENE	**1.4**	--	**0.56**	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
STYRENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
TERT-BUTYLBENZENE	**0.45 J**	--	**0.2 J**	--	**0.38 J**	--	--	**0.34 J**	**0.31 J**	--	--	0.25 U	--

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-3-B-MW1-1517	TS-3-B-MW1-1517-F	TS-3-B-MW3-2526	TS-3-B-MW3-2526-F	TS-3-B-MW4-3031	TS-3-B-MW4-3031-F	TS-3-B-MW6-3940			TS-3-B-MW6-3940-F		TS-3-C-MW1-1415	TS-3-C-MW1-1415-F
Sample ID	TS-3-B-MW1-1517	TS-3-B-MW1-1517-F	TS-3-B-MW3-2526	TS-3-B-MW3-2526-F	TS-3-B-MW4-3031	TS-3-B-MW4-3031-F	Dup 01	DUP01	TS-3-B-MW6-3940	Dup 01-F	TS-3-B-MW6-3940-F	TS-3-C-MW1-1415	TS-3-C-MW1-1415-F
Sample Date	7/21/2014	7/21/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014	7/21/2014	7/21/2014	7/21/2014	7/21/2014	7/21/2014	7/22/2014	7/22/2014
Start Depth (feet below ground)	15	15	25	25	30	30	39	39	39	39	39	14	14
End Depth (feet below ground)	17	17	26	26	31	31	40	40	40	40	40	15	15
Volatile Organic Compounds (µg/L)													
TETRACHLOROETHENE	**0.6**	--	**0.13 J**	--	0.25 U	--	--	0.25 U	0.25 U	--	--	**0.61**	--
TETRAHYDROFURAN	2.5 U	--	2.5 U	--	2.5 U	--	--	2.5 U	2.5 U	--	--	2.5 U	--
TOLUENE	**0.09 J**	--	**0.08 J**	--	**0.08 J**	--	--	0.25 U	0.25 U	--	--	**0.11 J**	--
TRANS-1,2-DICHLOROETHENE	0.25 U	--	0.25 U	--	0.25 U	--	--	**0.15 J**	**0.15 J**	--	--	0.25 U	--
TRANS-1,3-DICHLOROPROPENE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
TRICHLOROETHYLENE	**12**	--	**0.6 J**	--	**3.5 J**	--	--	**4.9**	**5.2**	--	--	**74 J**	--
TRICHLOROFLUOROMETHANE	0.25 U	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
VINYL CHLORIDE	**1.2**	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
XYLENE O	**0.12 J**	--	0.25 U	--	0.25 U	--	--	0.25 U	0.25 U	--	--	0.25 U	--
XYLENE P,M	0.5 U	--	**0.09 J**	--	0.5 U	--	--	0.5 U	0.5 U	--	--	0.5 U	--
RCRA8 Metals (µg/L)													
Dissolved													
ARSENIC	--	1.0 U	--	**2.6 J**	--	**0.5 J**	--	--	--	1.0 U	1.0 U	--	1.0 U
BARIUM	--	**14.6 J**	--	**8.5 J**	--	**21.9 J**	--	--	--	**21.4 J**	**22.8 J**	--	**12.3 J**
CADMIUM	--	0.12 U	--	0.12 U	--	0.12 U	--	--	--	0.25 U	0.24 U	--	**0.12 J**
CHROMIUM	--	3 U	--	**1.9 J**	--	3 U	--	--	--	3 U	3 U	--	3 UJ
LEAD	--	**0.7 J**	--	**0.6 J**	--	1.0 U	--	--	--	**0.8 J**	1.0 U	--	1.0 UJ
MERCURY	--	0.2 U	--	0.2 U	--	0.2 U	--	--	--	0.2 U	0.2 U	--	0.2 U
SELENIUM	--	2.0 U	--	2.0 U	--	2.0 U	--	--	--	2.0 U	2.0 U	--	**1.2 J**
SILVER	--	0.1 U	--	0.1 U	--	0.1 U	--	--	--	0.1 U	0.1 U	--	**0.11 J**
Total													
ARSENIC	**0.5 J**	--	**3.2 J**	--	**5.9 J**	--	1.0 U	--	1.0 U	--	--	1.0 U	--
BARIUM	**20.4 J**	--	**19.3 J**	--	**237**	--	**25.9**	--	**24.5 J**	--	--	**12.5 J**	--
CADMIUM	0.12 U	--	0.1 U	--	**1.91**	--	0.23 U	--	0.22 U	--	--	**0.12 J**	--
CHROMIUM	**24.1**	--	**33.4**	--	**276**	--	3 U	--	3 U	--	--	3 UJ	--
LEAD	**3.0**	--	**6.2**	--	**76.5**	--	**1.6 J**	--	**1 J**	--	--	1.0 UJ	--
MERCURY	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	0.2 U	--	--	0.2 U	--
SELENIUM	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--	2.0 U	--	--	**1.1 J**	--
SILVER	0.1 U	--	0.1 U	--	0.1 U	--	0.1 U	--	0.1 U	--	--	**0.13 J**	--

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-3-C-MW1-1415-FDUP	TS-3-C-MW1-1415DUP	TS-3-C-MW2-1820	TS-3-C-MW2-1820-F	TS-3-C-MW3-2324	TS-3-C-MW3-2324-F	TS-3-C-MW5-2324	TS-3-D-MW1-1315	TS-3-D-MW1-1315-F	TS-3-D-MW2-1921	TS-3-D-MW2-1921-F	TS-UP-1-MW1-1316
Sample ID	TS-3-C-MW1-1415-FDUP	TS-3-C-MW1-1415DUP	TS-3-C-MW2-1820	TS-3-C-MW2-1820-F	TS-3-C-MW3-2324	TS-3-C-MW3-2324-F	TS-3-C-MW5-2324	TS-3-D-MW1-1315	TS-3-D-MW1-1315-F	TS-3-D-MW2-1921	TS-3-D-MW2-1921-F	TS-UP-1-MW1-1316
Sample Date	7/22/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	7/23/2014
Start Depth (feet below ground)	14	14	18	18	23	23	23	13	13	19	19	13
End Depth (feet below ground)	15	15	20	20	24	24	24	15	15	21	21	16
Volatile Organic Compounds (µg/L)												
1,1-DICHLOROETHANE	--	--	**0.29 J**	--	--	--	0.25 U	**0.26 J**	--	**3.2**	--	0.25 U
1,1-DICHLOROETHENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,1-DICHLOROPROPENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,1,1-TRICHLOROETHANE	--	--	0.25 U	--	--	--	0.25 U	**0.19 J**	--	0.25 U	--	0.25 U
1,1,1,2-TETRACHLOROETHANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,1,2-TRICHLOROETHANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,1,2,2-TETRACHLOROETHANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,2-DIBROMO-3-CHLOROPROPANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,2-DIBROMOETHANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,2-DICHLOROBENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,2-DICHLOROETHANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,2-DICHLOROPROPANE	--	--	0.25 U	--	--	--	0.25 U	**0.94**	--	0.25 U	--	0.25 U
1,2,3-TRICHLOROBENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,2,3-TRICHLOROPROPANE	--	--	0.25 U	--	--	--	0.25 U	0.25 UJ	--	0.25 UJ	--	0.25 U
1,2,4-TRICHLOROBENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,2,4-TRIMETHYLBENZENE	--	--	**0.14 J**	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,3-DICHLOROBENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,3-DICHLOROPROPANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,3,5-TRIMETHYLBENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
1,4-DICHLOROBENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
2-BUTANONE (MEK)	--	--	5.0 U	--	--	--	5.0 U	5.0 U	--	5.0 U	--	5.0 U
2-CHLOROTOLUENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
2-HEXANONE	--	--	2.5 U	--	--	--	2.5 U	2.5 U	--	2.5 U	--	2.5 U
2,2-DICHLOROPROPANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
4-CHLOROTOLUENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
4-ISOPROPYLTOLUENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
4-METHYL-2-PENTANONE	--	--	2.5 U	--	--	--	2.5 U	2.5 U	--	2.5 U	--	2.5 U
ACETONE	--	--	5.0 U	--	--	--	5.0 U	5.0 U	--	5.0 U	--	5.0 U
BENZENE	--	--	**0.18 J**	--	--	--	0.25 U	0.25 U	--	**0.12 J**	--	0.25 U
BROMOBENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
BROMOCHLOROMETHANE	--	--	0.5 U	--	--	--	0.5 U	0.5 U	--	0.5 U	--	0.5 U
BROMODICHLOROMETHANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
BROMOFORM	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
CARBON DISULFIDE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
CARBON TETRACHLORIDE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
CHLOROBENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
CHLOROETHANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
CHLOROFORM	--	--	**0.1 J**	--	--	--	0.25 U	**0.19 J**	--	**0.63**	--	0.25 U
CHLOROMETHANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	**0.51 J**	--	0.25 U
CIS-1,2-DICHLOROETHENE	--	--	**2.7**	--	--	--	**2.2**	**1.7**	--	**39**	--	0.25 U
CIS-1,3-DICHLOROPROPENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
DIBROMOCHLOROMETHANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
DIBROMOMETHANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
DICHLORODIFLUOROMETHANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
DIISOPROPYL ETHER	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
ETHYLBENZENE	--	--	**0.09 J**	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
HEXACHLOROBUTADIENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
ISOPROPYLBENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
METHYL BROMIDE	--	--	0.59 U	--	--	--	0.59 U	0.59 U	--	0.59 U	--	0.59 U
METHYL TERT-BUTYL ETHER	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
METHYLENE CHLORIDE	--	--	**0.17 J**	--	--	--	**0.25 J**	0.25 U	--	**0.26 J**	--	0.25 U
N-BUTYL BENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
N-HEXANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
N-PROPYL BENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
NAPHTHALENE	--	--	**0.18 J**	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
SEC-BUTYL BENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
STYRENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
TERT-BUTYLBENZENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-3-C-MW1-1415-FDUP	TS-3-C-MW1-1415DUP	TS-3-C-MW2-1820	TS-3-C-MW2-1820-F	TS-3-C-MW3-2324	TS-3-C-MW3-2324-F	TS-3-C-MW5-2324	TS-3-D-MW1-1315	TS-3-D-MW1-1315-F	TS-3-D-MW2-1921	TS-3-D-MW2-1921-F	TS-UP-1-MW1-1316
Sample ID	TS-3-C-MW1-1415-FDUP	TS-3-C-MW1-1415DUP	TS-3-C-MW2-1820	TS-3-C-MW2-1820-F	TS-3-C-MW3-2324	TS-3-C-MW3-2324-F	TS-3-C-MW5-2324	TS-3-D-MW1-1315	TS-3-D-MW1-1315-F	TS-3-D-MW2-1921	TS-3-D-MW2-1921-F	TS-UP-1-MW1-1316
Sample Date	7/22/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	7/23/2014
Start Depth (feet below ground)	14	14	18	18	23	23	23	13	13	19	19	13
End Depth (feet below ground)	15	15	20	20	24	24	24	15	15	21	21	16
Volatile Organic Compounds (µg/L)												
TETRACHLOROETHENE	--	--	**0.23 J**	--	--	--	**0.18 J**	**1.8**	--	**3.7**	--	**0.22 J**
TETRAHYDROFURAN	--	--	2.5 U	--	--	--	2.5 U	2.5 U	--	2.5 U	--	2.5 U
TOLUENE	--	--	**0.24 J**	--	--	--	**0.09 J**	0.25 U	--	0.25 U	--	0.25 U
TRANS-1,2-DICHLOROETHENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	**0.41 J**	--	0.25 U
TRANS-1,3-DICHLOROPROPENE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
TRICHLOROETHYLENE	--	--	**21 J**	--	--	--	**11 J**	**75**	--	**180**	--	**1.4**
TRICHLOROFLUOROMETHANE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
VINYL CHLORIDE	--	--	0.25 U	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
XYLENE O	--	--	**0.09 J**	--	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U
XYLENE P,M	--	--	**0.22 J**	--	--	--	0.5 U	0.5 U	--	0.5 U	--	0.5 U
RCRA8 Metals (µg/L)												
Dissolved												
ARSENIC	1.0 U	--	--	**0.7 J**	--	1.0 U	--	--	3 U	--	3 U	--
BARIUM	**12.1 J**	--	--	**15.5 J**	--	**7.7 J**	--	--	**12.7 J**	--	**30.5 J**	--
CADMIUM	**0.03 J**	--	--	0.12 U	--	0.13 U	--	--	0.5 U	--	0.5 U	--
CHROMIUM	3 U	--	--	3 U	--	3 U	--	--	3 U	--	3 U	--
LEAD	1.0 U	--	--	**7.2**	--	1.0 U	--	--	**2.2 J**	--	3 U	--
MERCURY	0.2 U	--	--	0.2 U	--	0.2 U	--	--	0.2 U	--	0.2 U	--
SELENIUM	**1 J**	--	--	2.0 U	--	2.0 U	--	--	6 U	--	6 U	--
SILVER	0.1 UJ	--	--	0.1 U	--	0.1 U	--	--	0.3 U	--	0.3 U	--
Total												
ARSENIC	--	1.0 U	**1.7 J**	--	1.0 U	--	--	3 U	--	3 U	--	1.0 U
BARIUM	--	**12.8 J**	39.9	--	**12.1 J**	--	--	**20.6 J**	--	**43.5 J**	--	**18.6 J**
CADMIUM	--	**0.03 J**	0.16 U	--	0.18 U	--	--	0.62 U	--	0.5 U	--	**0.05 J**
CHROMIUM	--	3 U	**60.8**	--	**16.8**	--	--	**1.5 J**	--	3 U	--	**3 J**
LEAD	--	1.0 U	**5**	--	**2.6**	--	--	**3.4 J**	--	**2.6 J**	--	**0.7 J**
MERCURY	--	0.2 U	0.2 U	--	0.2 U	--	--	0.2 U	--	0.2 U	--	0.2 U
SELENIUM	--	**0.9 J**	2.0 U	--	2.0 U	--	--	6 U	--	6 U	--	2.0 U
SILVER	--	0.1 UJ	0.1 U	--	0.1 U	--	--	0.3 U	--	0.3 U	--	0.1 UJ

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-UP-1-MW1-1316-F	TS-UP-1-MW2-1821	TS-UP-1-MW2-1821-F	TS-UP-1-MW4-2427	TS-UP-1-MW4-2427-F	TS-UP-1-MW5-3033	TS-UP-1-MW6-3940			TS-UP-1-MW6-3940-F	
Sample ID	TS-UP-1-MW1-1316-F	TS-UP-1-MW2-1821	TS-UP-1-MW2-1821-F	TS-UP-1-MW4-2427	TS-UP-1-MW4-2427-F	TS-UP-1-MW5-3033	Dup 02	DUP-02	TS-UP-1-MW6-3940	Dup 02-F	TS-UP-1-MW6-3940-F
Sample Date	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014
Start Depth (feet below ground)	13	18	18	27	27	30	39	39	39	39	39
End Depth (feet below ground)	16	21	21	27	27	33	40	40	40	40	40
Volatile Organic Compounds (µg/L)											
1,1-DICHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,1-DICHLOROETHENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,1-DICHLOROPROPENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,1,1-TRICHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,1,1,2-TETRACHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,1,2-TRICHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,1,2,2-TETRACHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,2-DIBROMO-3-CHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,2-DIBROMOETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,2-DICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,2-DICHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,2-DICHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,2,3-TRICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,2,3-TRICHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,2,4-TRICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,2,4-TRIMETHYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,3-DICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,3-DICHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,3,5-TRIMETHYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
1,4-DICHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
2-BUTANONE (MEK)	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	5.0 U	--	--
2-CHLOROTOLUENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
2-HEXANONE	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U	--	--
2,2-DICHLOROPROPANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
4-CHLOROTOLUENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
4-ISOPROPYLTOLUENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
4-METHYL-2-PENTANONE	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U	--	--
ACETONE	--	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	5.0 U	--	--
BENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	**0.14 J**	**0.14 J**	--	--
BROMOBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
BROMOCHLOROMETHANE	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	0.5 U	--	--
BROMODICHLOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
BROMOFORM	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
CARBON DISULFIDE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
CARBON TETRACHLORIDE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
CHLOROBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
CHLOROETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
CHLOROFORM	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
CHLOROMETHANE	--	0.25 U	--	0.25 U	--	0.47 J	--	0.25 U	**0.47 J**	--	--
CIS-1,2-DICHLOROETHENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
CIS-1,3-DICHLOROPROPENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
DIBROMOCHLOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
DIBROMOMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
DICHLORODIFLUOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
DIISOPROPYL ETHER	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
ETHYLBENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
HEXACHLOROBUTADIENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
ISOPROPYLBENZENE	--	0.25 U	--	**0.11 J**	--	0.25 U	--	0.25 U	0.25 U	--	--
METHYL BROMIDE	--	0.59 U	--	0.59 U	--	0.59 U	--	0.59 U	0.59 U	--	--
METHYL TERT-BUTYL ETHER	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
METHYLENE CHLORIDE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
N-BUTYL BENZENE	--	0.25 U	--	**0.21 J**	--	0.25 U	--	0.25 U	0.25 U	--	--
N-HEXANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
N-PROPYL BENZENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
NAPHTHALENE	--	0.25 U	--	0.25 U	--	**0.19 J**	--	0.25 U	0.25 U	--	--
SEC-BUTYL BENZENE	--	**0.78**	--	**2**	--	**1.5**	--	**0.62**	**0.84**	--	--
STYRENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
TERT-BUTYLBENZENE	--	**0.39 J**	--	**1.2**	--	**1.1**	--	**0.66**	**0.85**	--	--

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-UP-1-MW1-1316-F	TS-UP-1-MW2-1821	TS-UP-1-MW2-1821-F	TS-UP-1-MW4-2427	TS-UP-1-MW4-2427-F	TS-UP-1-MW5-3033	TS-UP-1-MW6-3940			TS-UP-1-MW6-3940-F	
Sample ID	TS-UP-1-MW1-1316-F	TS-UP-1-MW2-1821	TS-UP-1-MW2-1821-F	TS-UP-1-MW4-2427	TS-UP-1-MW4-2427-F	TS-UP-1-MW5-3033	Dup 02	DUP-02	TS-UP-1-MW6-3940	Dup 02-F	TS-UP-1-MW6-3940-F
Sample Date	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014
Start Depth (feet below ground)	13	18	18	27	27	30	39	39	39	39	39
End Depth (feet below ground)	16	21	21	27	27	33	40	40	40	40	40
Volatile Organic Compounds (µg/L)											
TETRACHLOROETHENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
TETRAHYDROFURAN	--	2.5 U	--	2.5 U	--	2.5 U	--	2.5 U	2.5 U	--	--
TOLUENE	--	0.25 U	--	0.25 U	--	**0.16 J**	--	0.25 U	**0.15 J**	--	--
TRANS-1,2-DICHLOROETHENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
TRANS-1,3-DICHLOROPROPENE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
TRICHLOROETHYLENE	--	0.25 U	--	0.25 U	--	**0.43 J**	--	**1.2**	**0.91**	--	--
TRICHLOROFLUOROMETHANE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
VINYL CHLORIDE	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
XYLENE O	--	0.25 U	--	0.25 U	--	0.25 U	--	0.25 U	0.25 U	--	--
XYLENE P,M	--	0.5 U	--	0.5 U	--	0.5 U	--	0.5 U	0.5 U	--	--
RCRA8 Metals (µg/L)											
Dissolved											
ARSENIC	1.0 U	--	1.0 U	--	1.0 U	--	--	--	--	1.0 U	1.0 U
BARIUM	**12.8 J**	--	**16.9 J**	--	**17.6 J**	--	--	--	--	**9.6 J**	**12.3 J**
CADMIUM	**0.05 J**	--	**0.05 J**	--	**0.13 J**	--	--	--	--	**0.18 J**	**0.35 J**
CHROMIUM	3 UJ	--	3 UJ	--	3 UJ	--	--	--	--	3 UJ	**1.6 J**
LEAD	1.0 UJ	--	1.0 UJ	--	**0.9 J**	--	--	--	--	1.0 UJ	**0.6 J**
MERCURY	0.2 U	--	0.2 U	--	0.2 U	--	--	--	--	0.2 U	0.2 U
SELENIUM	2.0 U	--	2.0 U	--	2.0 U	--	--	--	--	2.0 U	2.0 U
SILVER	0.1 UJ	--	0.1 UJ	--	0.1 UJ	--	--	--	--	0.1 UJ	0.1 UJ
Total											
ARSENIC	--	1.0 U	--	**0.6 J**	--	--	**4.9 J**	--	**6.4 J**	--	--
BARIUM	--	**17.5 J**	--	**27.3 J**	--	--	**726 J**	--	**922 J**	--	--
CADMIUM	--	**0.05 J**	--	**0.17 J**	--	--	**3.25 J**	--	**4.24 J**	--	--
CHROMIUM	--	**3.2 J**	--	**26.2 J**	--	--	**630 J**	--	**606 J**	--	--
LEAD	--	1.0 UJ	--	**4.2 J**	--	--	**216 J**	--	**304 J**	--	--
MERCURY	--	0.2 U	--	0.2 U	--	--	0.2 U	--	0.2 U	--	--
SELENIUM	--	2.0 U	--	2.0 U	--	--	2.0 U	--	2.0 U	--	--
SILVER	--	0.1 UJ	--	0.1 UJ	--	--	0.1 UJ	--	0.1 UJ	--	--

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-UP-1-MW6-3940-FDU	TS-UP-1-MW6-3940DUP	TS-UP-2-MW1-1316	TS-UP-2-MW1-1316-F	TS-UP-2-MW2-1821	TS-UP-2-MW2-1821-F	TS-UP-2-MW3-2225	TS-UP-2-MW3-2225-F
Sample ID	TS-UP-1-MW6-3940-FDUP	TS-UP-1-MW6-3940DUP	TS-UP-2-MW1-1316	TS-UP-2-MW1-1316-F	TS-UP-2-MW2-1821	TS-UP-2-MW2-1821-F	TS-UP-2-MW3-2225	TS-UP-2-MW3-2225-F
Sample Date	7/23/2014	7/23/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/23/2014	7/23/2014
Start Depth (feet below ground)	39	39	13	13	18	18	22	22
End Depth (feet below ground)	40	40	16	16	21	21	25	25
Volatile Organic Compounds (µg/L)								
1,1-DICHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,1-DICHLOROETHENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,1-DICHLOROPROPENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,1,1-TRICHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,1,1,2-TETRACHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,1,2-TRICHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,1,2,2-TETRACHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DIBROMO-3-CHLOROPROPANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DIBROMOETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DICHLOROBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DICHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2-DICHLOROPROPANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2,3-TRICHLOROBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2,3-TRICHLOROPROPANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2,4-TRICHLOROBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,2,4-TRIMETHYLBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,3-DICHLOROBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,3-DICHLOROPROPANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,3,5-TRIMETHYLBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
1,4-DICHLOROBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
2-BUTANONE (MEK)	--	--	5.0 U	--	5.0 U	--	5.0 U	--
2-CHLOROTOLUENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
2-HEXANONE	--	--	2.5 U	--	2.5 U	--	2.5 U	--
2,2-DICHLOROPROPANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
4-CHLOROTOLUENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
4-ISOPROPYLTOLUENE	--	--	0.25 U	--	0.25 U	--	**0.1 J**	--
4-METHYL-2-PENTANONE	--	--	2.5 U	--	2.5 U	--	2.5 U	--
ACETONE	--	--	5.0 U	--	5.0 U	--	5.0 U	--
BENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
BROMOBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
BROMOCHLOROMETHANE	--	--	0.5 U	--	0.5 U	--	0.5 U	--
BROMODICHLOROMETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
BROMOFORM	--	--	0.25 U	--	0.25 U	--	0.25 U	--
CARBON DISULFIDE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
CARBON TETRACHLORIDE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
CHLOROBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
CHLOROETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
CHLOROFORM	--	--	0.25 U	--	0.25 U	--	0.25 U	--
CHLOROMETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
CIS-1,2-DICHLOROETHENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
CIS-1,3-DICHLOROPROPENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
DIBROMOCHLOROMETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
DIBROMOMETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
DICHLORODIFLUOROMETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
DIISOPROPYL ETHER	--	--	0.25 U	--	0.25 U	--	0.25 U	--
ETHYLBENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
HEXACHLOROBUTADIENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
ISOPROPYLBENZENE	--	--	0.25 U	--	**0.22 J**	--	**0.32 J**	--
METHYL BROMIDE	--	--	0.59 U	--	0.59 U	--	0.59 U	--
METHYL TERT-BUTYL ETHER	--	--	0.25 U	--	0.25 U	--	0.25 U	--
METHYLENE CHLORIDE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
N-BUTYL BENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
N-HEXANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
N-PROPYL BENZENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
NAPHTHALENE	--	--	0.25 U	--	**0.21 J**	--	0.25 U	--
SEC-BUTYL BENZENE	--	--	0.25 U	--	**2.5**	--	**3.8**	--
STYRENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
TERT-BUTYLBENZENE	--	--	0.25 U	--	**1.4**	--	**2.2**	--

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Table 5-1
2014 Temporary Groundwater Vertical Profiling Analytical Data Summary
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

Location	TS-UP-1-MW6-3940-FDU	TS-UP-1-MW6-3940DUP	TS-UP-2-MW1-1316	TS-UP-2-MW1-1316-F	TS-UP-2-MW2-1821	TS-UP-2-MW2-1821-F	TS-UP-2-MW3-2225	TS-UP-2-MW3-2225-F
Sample ID	TS-UP-1-MW6-3940-FDUP	TS-UP-1-MW6-3940DUP	TS-UP-2-MW1-1316	TS-UP-2-MW1-1316-F	TS-UP-2-MW2-1821	TS-UP-2-MW2-1821-F	TS-UP-2-MW3-2225	TS-UP-2-MW3-2225-F
Sample Date	7/23/2014	7/23/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/23/2014	7/23/2014
Start Depth (feet below ground)	39	39	13	13	18	18	22	22
End Depth (feet below ground)	40	40	16	16	21	21	25	25
Volatile Organic Compounds (µg/L)								
TETRACHLOROETHENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
TETRAHYDROFURAN	--	--	2.5 U	--	2.5 U	--	2.5 U	--
TOLUENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
TRANS-1,2-DICHLOROETHENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
TRANS-1,3-DICHLOROPROPENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
TRICHLOROETHYLENE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
TRICHLOROFLUOROMETHANE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
VINYL CHLORIDE	--	--	0.25 U	--	0.25 U	--	0.25 U	--
XYLENE O	--	--	0.25 U	--	0.25 U	--	0.25 U	--
XYLENE P,M	--	--	0.5 U	--	0.5 U	--	0.5 U	--
RCRA8 Metals (µg/L)								
Dissolved								
ARSENIC	1.0 U	--	--	1.0 U	--	**1.1 J**	--	1.0 U
BARIUM	**10.3 J**	--	--	**18.1 J**	--	**15.7 J**	--	**20.1 J**
CADMIUM	**0.25 J**	--	--	**0.2**	--	**0.05 J**	--	**0.07 J**
CHROMIUM	3 UJ	--	--	3 U	--	3 U	--	3 UJ
LEAD	1.0 UJ	--	--	1.0 U	--	**2.6**	--	1.0 UJ
MERCURY	0.2 U	--	--	0.2 U	--	0.2 U	--	0.2 U
SELENIUM	2.0 U	--	--	2.0 U	--	2.0 U	--	2.0 U
SILVER	0.1 U	--	--	**0.95**	--	**0.37 J**	--	0.1 UJ
Total								
ARSENIC	--	**5.9**	1.0 U	--	**0.7 J**	--	1.0 U	--
BARIUM	--	**908**	**17.2 J**	--	**24.1 J**	--	**25.4 J**	--
CADMIUM	--	**4.27**	0.18	--	**0.07 J**	--	**0.09 J**	--
CHROMIUM	--	**637**	3 U	--	**39.7**	--	**19.4 J**	--
LEAD	--	**305**	**0.7 J**	--	**2.2 J**	--	1.0 UJ	--
MERCURY	--	0.2 U	0.2 U	--	0.2 U	--	0.2 U	--
SELENIUM	--	2.0 U	2.0 U	--	2.0 U	--	2.0 U	--
SILVER	--	0.1 U	0.1 U	--	0.1 U	--	0.1 UJ	--

Notes:
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	EA20VP	EA27VP	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8	GP-TR3B 6-6.5		UVF-18
			SAMPLE ID	EA20VP-031406	EA27VP-031406	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8	GP-TR3B 6-6.5	GP-TR3B 6-6.5DUP	UVF-18_14.25-15.5
			SAMPLE DATE	14-Mar-06	14-Mar-06	17-Nov-11	17-Nov-11	17-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	22-Nov-10
			QC IDENTIFIER								DUPLICATE	DUPLICATE	
ANALYTE	**CAS**	**HH**	**ECO**										
VOCs (µg/kg)													
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	210 U	1.0 U	4.3 U	4.2 U	4.1 U	99.2 U	88.2 U	102 U	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	110 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHAN	76-13-1	670000		1040 U	7.0 U	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	320	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,1-DICHLOROETHANE	75-34-3	3600	140	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	**48.5**	50.9 U	---	---
1,1-DICHLOROETHENE	75-35-4	23000	40	420 U	3.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,1-DICHLOROPROPENE	563-58-6			210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	210 U	1.0 U	4.3 U	4.2 U	4.1 U	**63300**	**14200**	**12400**	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	210 U	1.0 U	4.3 U	4.2 U	4.1 U	297 U	265 U	306 U	---	---
1,2-DIBROMOETHANE	106-93-4	36	1230	110 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,2-DICHLOROETHANE	107-06-2	460	400	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	280	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	210 U	1.0 U	4.3 U	4.2 U	4.1 U	**14700**	**3670**	**2840**	---	---
1,3-DICHLOROBENZENE	541-73-1		80	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,3-DICHLOROPROPANE	142-28-9	160000		110 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
1,4-DIOXANE	123-91-1			11000 U	68 U	---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7			210 U	1.0 U	4.3 U	4.2 U	4.1 U	99.2 U	88.2 U	102 U	---	---
2-BUTANONE (MEK)	78-93-3	2700000	1000	4200 U	27 U	43.1 U	**7.2 J**	40.9 U	198 U	**2790**	204 U	---	---
2-CHLOROTOLUENE	95-49-8	160000		210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
2-HEXANONE	591-78-6	20000	360	2100 U	14 U	43.1 U	41.8 U	40.9 U	198 U	176 U	204 U	---	---
4-CHLOROTOLUENE	106-43-4	160000		210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	10	210 U	1.0 U	4.3 U	4.2 U	4.1 U	**750**	**172**	**145**	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	2100 U	14 U	43.1 U	41.8 U	40.9 U	496 U	**358000**	**210 J**	---	---
ACETONE	67-64-1	6100000	40	11000 U	6.8 U	43.1 U	**70**	40.9 U	487 U	**2280**	285 U	---	---
ACRYLONITRILE	107-13-1			2100 U	14 U	---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	120	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	**475**	50.9 U	---	0.22 U
BROMOBENZENE	108-86-1	29000		210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
BROMOMETHANE	74-83-9			1100 U	7.0 U	8.6 U	8.4 U	8.2 U	99.2 U	88.2 U	102 U	---	---
BROMOCHLOROMETHANE	74-97-5	15000		210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
BROMODICHLOROMETHANE	75-27-4	290	540	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
BROMOFORM	75-25-2	19000	70	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
CARBON DISULFIDE	75-15-0	77000	5	630 U	4.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
CARBON TETRACHLORIDE	56-23-5	650	50	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
CHLOROBENZENE	108-90-7	28000	2400	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
CHLOROETHANE	75-00-3	1400000		2100 U	14 U	8.6 U	8.4 U	8.2 U	99.2 U	88.2 U	102 U	---	---
CHLOROFORM	67-66-3	320	50	420 U	3.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
CHLOROMETHANE	74-87-3	11000	10400	1100 U	7.0 U	8.6 U	8.4 U	8.2 U	99.2 U	88.2 U	102 U	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	210 U	1.0 U	4.3 U	4.2 U	4.1 U	**114**	**153**	**86.6**	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5		398	110 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300		110 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
DIBROMOMETHANE	74-95-3	2400	65000	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	2100 U	14 U	8.6 U	8.4 U	8.2 U	49.6 U	44.1 U	50.9 U	---	---
DIETHYLETHER	60-29-7			2100 U	14 U	---	---	---	---	---	---	---	---
DIISOPROPYL ETHER	108-20-3			110 U	1.0 U	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	210 U	1.0 U	**2.1 J**	**2.3 J**	**2.1 J**	**1890**	**77900**	**321**	---	0.22 U
HEXACHLOROBUTADIENE	87-68-3	1200	9	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
ISOPROPYLBENZENE	98-82-8	190000	40	210 U	1.0 U	4.3 U	4.2 U	4.1 U	**1070**	**715**	**195**	---	---
METHYL BROMIDE	74-83-9			1100 U	7.0 U	8.6 U	8.4 U	8.2 U	99.2 U	88.2 U	102 U	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000		420 U	3.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	0.05 U
METHYLENE CHLORIDE	75-09-2	35000	210	2100 U	14 U	21.6 U	20.9 U	20.5 U	198 U	**1060**	204 U	---	---
NAPHTHALENE	91-20-3	3800	20000	1100 U	7.0 U	0.0043 U	0.0042 U	0.0041 U	**0.0357 J**	**0.0749**	0.0509 U	---	---
N-BUTYL BENZENE	104-51-8	390000		210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
N-PROPYL BENZENE	103-65-1	380000		210 U	1.0 U	4.3 U	4.2 U	4.1 U	**9050**	**2040**	**1600**	---	---

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	EA20VP	EA27VP	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8	GP-TR3B 6-6.5		UVF-18
			SAMPLE ID	EA20VP-031406	EA27VP-031406	GP-TR1B 6-6.5	GP-TR2A 6-7	GP-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8	GP-TR3B 6-6.5	GP-TR3B 6-6.5DUP	UVF-18_14.25-15.5
			SAMPLE DATE	14-Mar-06	14-Mar-06	17-Nov-11	17-Nov-11	17-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	22-Nov-10
			QC IDENTIFIER								DUPLICATE	DUPLICATE	
ANALYTE	**CAS**	**HH**	**ECO**										
VOCs (µg/kg)													
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6			210 U	1.0 U	4.3 U	4.2 U	4.1 U	**750**	**172**	**145**	---	---
SEC-BUTYL BENZENE	135-98-8	780000		210 U	1.0 U	4.3 U	4.2 U	4.1 U	**1960**	**398**	**378**	---	---
STYRENE	100-42-5	600000	1200	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
TERT-AMYL METHYL ETHER	994-05-8			110 U	1.0 U	---	---	---	---	---	---	---	---
TERT-BUTYL ALCOHOL	75-65-0			4200 U	27 U	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000		210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
TERT-BUTYLETHYL ETHER	637-92-3			110 U	1.0 U	---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60	210 U	1.0 U	4.3 U	4.2 U	4.1 U	**165**	**154**	**50.9 J**	---	---
TETRAHYDROFURAN	109-99-9	1800		1100 U	7.0 U	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	490000	150	210 U	1.0 U	**2.5 J**	**4.1 J**	**2.5 J**	**330**	**433000**	**131**	---	0.22 U
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	210 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6		398	110 U	1.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
TRANS-1,4-DICHLORO-2-BUTENE	764-41-0			420 U	7.0 U	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60	210 U	1.0 U	**1.8 J**	**3.4 J**	**5.8**	**2140**	**2580**	**715**	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	1100 U	7.0 U	4.3 U	4.2 U	4.1 U	49.6 U	44.1 U	50.9 U	---	---
VINYL CHLORIDE	75-01-4	59	30	1100 U	7.0 U	8.6 U	8.4 U	8.2 U	49.6 U	44.1 U	50.9 U	---	---
XYLENE O	95-47-6	65000	100	210 U	1.0 U	**4.2 J**	**3.3 J**	**3.4 J**	**3480**	**116000**	**644**	---	0.22 U
XYLENE P,M	179601-23-1		100	420 U	3.0 U	**13.0**	**13.8**	**12.2**	**5690**	**372000**	**1050**	---	0.44 U
TOTAL XYLENES	1330-20-7	58000		210 U	1.0 U	**17.2 J**	**17.1 J**	**15.6 J**	**9170**	**488000**	**1694**		0.22 U
SVOC (µg/kg)													
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1		80	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	---	---	---	---	---	---	---	---	---	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000		---	---	---	---	---	---	---	---	---	---
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	---	---	---	---	---	---	---	---	---	---
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	---	---	---	---	---	---	---	---	---	---
2,4-DICHLOROPHENOL	120-83-2	19000	20000	---	---	---	---	---	---	---	---	---	---
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	---	---	---	---	---	---	---	---	---	---
2,4-DINITROPHENOL	51-28-5	13000	61	---	---	---	---	---	---	---	---	---	---
2,4-DINITROTOLUENE	121-14-2	1700	6000	---	---	---	---	---	---	---	---	---	---
2,6-DINITROTOLUENE	606-20-2	360	4000	---	---	---	---	---	---	---	---	---	---
2-CHLORONAPHTHALENE	91-58-7	480000	12.2	---	---	---	---	---	---	---	---	---	---
2-CHLOROPHENOL	95-57-8	39000	60	---	---	---	---	---	---	---	---	---	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	---	---	---	---	---	---	---	---	---	---
2-NITROANILINE	88-74-4	63000	20	---	---	---	---	---	---	---	---	---	---
2-NITROPHENOL	88-75-5		1600	---	---	---	---	---	---	---	---	---	---
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	---	---	---	---	---	---	---	---	---	---
3-NITROANILINE	99-09-2		3160	---	---	---	---	---	---	---	---	---	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	---	---	---	---	---	---	---	---	---	---
4-BROMOPHENYL PHENYL ETHER	101-55-3			---	---	---	---	---	---	---	---	---	---
4-CHLORO-3-METHYLPHENOL	59-50-7	630000		---	---	---	---	---	---	---	---	---	---
4-CHLOROANILINE	106-47-8	2700	1000	---	---	---	---	---	---	---	---	---	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3			---	---	---	---	---	---	---	---	---	---
4-NITROANILINE	100-01-6	25000	21900	---	---	---	---	---	---	---	---	---	---
4-NITROPHENOL	100-02-7		5120	---	---	---	---	---	---	---	---	---	---
BENZOIC ACID	65-85-0	25000000	10	---	---	---	---	---	---	---	---	---	---
BENZYL ALCOHOL	100-51-6	630000	2	---	---	---	---	---	---	---	---	---	---
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000		---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230		---	---	---	---	---	---	---	---	---	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20	---	---	---	---	---	---	---	---	---	---
CARBAZOLE	86-74-8		70	---	---	---	---	---	---	---	---	---	---
CRESOLS, M- & P-				---	---	---	---	---	---	---	---	---	---
DIBENZOFURAN	132-64-9	7300	150	---	---	---	---	---	---	---	---	---	---
DIETHYL PHTHALATE	84-66-2	5100000	250	---	---	---	---	---	---	---	---	---	---
DIMETHYL PHTHALATE	131-11-3		100000	---	---	---	---	---	---	---	---	---	---
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	---	---	---	---	---	---	---	---	---	---

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	EA20VP	EA27VP	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8	GP-TR3B 6-6.5		UVF-18
			SAMPLE ID	EA20VP-031406	EA27VP-031406	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8	GP-TR3B 6-6.5	GP-TR3B 6-6.5DUP	UVF-18_14.25-15.5
			SAMPLE DATE	14-Mar-06	14-Mar-06	17-Nov-11	17-Nov-11	17-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	22-Nov-10
			QC IDENTIFIER								DUPLICATE	DUPLICATE	
ANALYTE	**CAS**	**HH**	**ECO**										
SVOC (µg/kg)													
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBENZENE	118-74-1	210	79	---	---	---	---	---	---	---	---	---	---
HEXACHLOROETHANE	67-72-1	1800	24	---	---	---	---	---	---	---	---	---	---
ISOPHORONE	78-59-1	570000	139000	---	---	---	---	---	---	---	---	---	---
NITROBENZENE	98-95-3	5100	2200	---	---	---	---	---	---	---	---	---	---
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	---	---	---	---	---	---	---	---	---	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	---	---	---	---	---	---	---	---	---	---
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	---	---	---	---	---	---	---	---	---	---
PENTACHLOROPHENOL	87-86-5	1000	2100	---	---	---	---	---	---	---	---	---	---
PHENOL	108-95-2	1900000	30000	---	---	---	---	---	---	---	---	---	---
PAHs (µg/kg)													
1-METHYLNAPHTHALENE	90-12-0	18000	140	---	---	---	---	---	---	---	---	---	---
2-METHYLNAPHTHALENE	91-57-6	24000	110	---	---	---	---	---	---	---	---	---	0.21 U
ACENAPHTHENE	83-32-9	360000	250	---	---	---	---	---	---	---	---	---	0.42 U
ACENAPHTHYLENE	208-96-8	360000	340	---	---	---	---	---	---	---	---	---	0.21 U
ANTHRACENE	120-12-7	1800000	1.5	---	---	---	---	---	---	---	---	---	0.42 U
BENZO(A)ANTHRACENE	56-55-3	1100	1100	---	---	---	---	---	---	---	---	---	0.42 U
BENZO(A)PYRENE	50-32-8	110	1100	---	---	---	---	---	---	---	---	---	0.42 U
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	---	---	---	---	---	---	---	---	---	0.42 U
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	---	---	---	---	---	---	---	---	---	0.42 U
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	---	---	---	---	---	---	---	---	---	0.42 U
CHRYSENE	218-01-9	110000	1100	---	---	---	---	---	---	---	---	---	0.42 U
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	---	---	---	---	---	---	---	---	---	0.21 U
FLUORANTHENE	206-44-0	240000	29000	---	---	---	---	---	---	---	---	---	0.42 U
FLUORENE	86-73-7	240000	30000	---	---	---	---	---	---	---	---	---	0.42 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	---	---	---	---	---	---	---	---	---	0.42 U
NAPHTHALENE	91-20-3	2000	160	---	---	---	---	---	---	---	---	---	0.42 U
PHENANTHRENE	85-01-8	180000	29000	---	---	---	---	---	---	---	---	---	0.42 U
PYRENE	129-00-0	180000	1100	---	---	---	---	---	---	---	---	---	0.42 U
TPH (mg/kg)													
TOTAL PETROLEUM HYDROCARBONS				**400**	**150**	---	---	---	---	---	---	---	---
VPH (µg/kg)													
C5-C8 ALIPHATICS		52000		---	---	---	---	---	---	---	---	---	191 U
C9-C10 AROMATICS		9700		---	---	---	---	---	---	---	---	---	11.0 U
C9-C12 ALIPHATICS		9600		---	---	---	---	---	---	---	---	---	191 U
EPH (µg/kg)													
C11-C22 AROMATICS		9700		---	---	---	---	---	---	---	---	---	191 U
C11-C22 UNAJUSTED AROMATICS				---	---	---	---	---	---	---	---	---	15.7 U
C19-C36 ALIPHATICS		23000000		---	---	---	---	---	---	---	---	---	15.7 U
C9-C18 ALIPHATICS		9600		---	---	---	---	---	---	---	---	---	15.7 U
PCBs (µg/kg)													
AROCLOR 1016	12674-11-2	410		---	---	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2	200		---	---	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5	170		---	---	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9	230		---	---	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6	230		---	---	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1	120		---	---	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5	240	20	---	---	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	120	20	---	---	---	---	---	---	---	---	---	---
METALS (mg/kg)													
ALUMINUM	7429-90-5	7700		---	---	---	---	---	---	---	---	---	---
ANTIMONY	7440-36-0	3.1	0.27	---	---	---	---	---	---	---	---	---	---
ARSENIC	7440-38-2	0.68	18	---	---	**2.1 J**	**1.9 J**	**2.8**	---	**2.8**	**3.1**	---	---
BARIUM	7440-39-3	1500	330	---	---	**5.3**	**10.5**	**8.0**	---	**8.5**	**9.1**	---	---
BERYLLIUM	7440-41-7	16	10	---	---	---	---	---	---	---	---	---	---
CADMIUM	7440-43-9	7.1	0.36	---	---	0.5 U	**0.7**	**0.7**	---	**0.1 J**	**0.2 J**	---	---
CALCIUM	7440-70-2			---	---	---	---	---	---	---	---	---	---
CHROMIUM	7440-47-3	12000	0.4	---	---	**2.3**	**6.0**	**2.4**	---	**13.4**	**6.9**	---	---

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	EA20VP	EA27VP	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8	GP-TR3B 6-6.5		UVF-18
			SAMPLE ID	EA20VP-031406	EA27VP-031406	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8	GP-TR3B 6-6.5	GP-TR3B 6-6.5DUP	UVF-18_14.25-15.5
			SAMPLE DATE	14-Mar-06	14-Mar-06	17-Nov-11	17-Nov-11	17-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	22-Nov-10
			QC IDENTIFIER								DUPLICATE	DUPLICATE	
ANALYTE	**CAS**	**HH**	**ECO**										
METALS (mg/kg)													
COBALT	7440-48-4	2.3	2.4	---	---	---	---	---	---	---	---	---	---
COPPER	7440-50-8	310	28	---	---	---	---	---	---	---	---	---	---
IRON	7439-89-6	5500		---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	400	11	---	---	**3.4 J**	**25.6**	**17.2**	---	**32.8**	**21.6**	---	---
MAGNESIUM	7439-95-4			---	---	---	---	---	---	---	---	---	---
MANGANESE	7439-96-5	180	220	---	---	---	---	---	---	---	---	---	---
MERCURY	7439-97-6	2.3	0.013	---	---	0.034 U	0.035 U	0.031 U	---	0.034 U	0.033 U	0.032 U	---
NICKEL	7440-02-0	150	38	---	---	---	---	---	---	---	---	---	---
POTASSIUM	7440-09-7			---	---	---	---	---	---	---	---	---	---
SELENIUM	7782-49-2	39	0.52	---	---	4.5 U	4.6 U	5.1 U	---	4.5 U	4.8 U	---	---
SILVER	7440-22-4	39	4.2	---	---	0.5 U	0.5 U	0.5 U	---	0.4 U	0.5 U	---	---
SODIUM	7440-23-5			---	---	---	---	---	---	---	---	---	---
THALLIUM	7440-28-0	0.078	0.22	---	---	---	---	---	---	---	---	---	---
VANADIUM	7440-62-2	39	2	---	---	---	---	---	---	---	---	---	---
ZINC	7440-66-6	2300	46	---	---	---	---	---	---	---	---	---	---
TOC (mg/kg)													
TOTAL ORGANIC CARBON				---	---	---	---	---	---	---	---	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 1997)
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-101			SB-102	SB-103			SB-104	SB-105	
				SAMPLE ID	SB-101A 0-4	SB-101A 4-6	SB-101A 4-6 Dup	SB-102A 5-7	SB-103A 0-4	SB-103A 0-4 Dup	SB-103A 4-6	SB-104A 5-7	SB-105A 8-10	SB-105A 8-12
				SAMPLE DATE	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11
				QC IDENTIFIER		DUPLICATE	DUPLICATE		DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**HH**	**ECO**											
VOCs (µg/kg)														
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHAN	76-13-1	670000		---	---	---	---	---	---	---	---	---	---	
1,1,2-TRICHLOROETHANE	79-00-5	150	320	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,1-DICHLOROETHANE	75-34-3	3600	140	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,1-DICHLOROETHENE	75-35-4	23000	40	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,1-DICHLOROPROPENE	563-58-6			---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	---	**1.7 J**	**1.3 J**	**3.9 J**	---	---	**6.6**	**5.2**	3.7 U	---	
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,2-DIBROMOETHANE	106-93-4	36	1230	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,2-DICHLOROBENZENE	95-50-1	180000	90	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,2-DICHLOROETHANE	107-06-2	460	400	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,2-DICHLOROPROPANE	78-87-5	1600	280	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	---	2.2 U	2.2 U	4.0 U	---	---	**1.2 J**	0.9 **J**	3.7 U	---	
1,3-DICHLOROBENZENE	541-73-1		80	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,3-DICHLOROPROPANE	142-28-9	160000		---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,4-DICHLOROBENZENE	106-46-7	2600	880	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
1,4-DIOXANE	123-91-1			---	---	---	---	---	---	---	---	---	---	
2,2-DICHLOROPROPANE	594-20-7			---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
2-BUTANONE (MEK)	78-93-3	2700000	1000	---	21.9 U	21.6 U	39.6 U	---	---	34.3 U	27.1 U	36.9 U	---	
2-CHLOROTOLUENE	95-49-8	160000		---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
2-HEXANONE	591-78-6	20000	360	---	21.9 U	21.6 U	39.6 U	---	---	34.3 U	27.1 U	36.9 U	---	
4-CHLOROTOLUENE	106-43-4	160000		---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
4-ISOPROPYLTOLUENE	99-87-6	190000	10	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	---	21.9 U	21.6 U	39.6 U	---	---	34.3 U	27.1 U	36.9 U	---	
ACETONE	67-64-1	6100000	40	---	21.9 U	21.6 U	**3.9 J**	---	---	**5.2 J**	**3.0 J**	36.9 U	---	
ACRYLONITRILE	107-13-1			---	---	---	---	---	---	---	---	---	---	
BENZENE	71-43-2	1200	120	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
BROMOBENZENE	108-86-1	29000		---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
BROMOMETHANE	74-83-9			---	4.4 U	4.3 U	7.9 U	---	---	6.9 U	5.4 U	7.4 U	---	
BROMOCHLOROMETHANE	74-97-5	15000		---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
BROMODICHLOROMETHANE	75-27-4	290	540	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
BROMOFORM	75-25-2	19000	70	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
CARBON DISULFIDE	75-15-0	77000	5	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	4.7 U	---	
CARBON TETRACHLORIDE	56-23-5	650	50	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
CHLOROBENZENE	108-90-7	28000	2400	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
CHLOROETHANE	75-00-3	1400000		---	4.4 U	4.3 U	7.9 U	---	---	6.9 U	5.4 U	7.4 U	---	
CHLOROFORM	67-66-3	320	50	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
CHLOROMETHANE	74-87-3	11000	10400	---	4.4 U	4.3 U	7.9 U	---	---	6.9 U	5.4 U	7.4 U	---	
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
CIS-1,3-DICHLOROPROPENE	10061-01-5		398	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
DIBROMOCHLOROMETHANE	124-48-1	8300		---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
DIBROMOMETHANE	74-95-3	2400	65000	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	---	4.4 U	4.3 U	7.9 U	---	---	6.9 U	5.4 U	7.4 U	---	
DIETHYLETHER	60-29-7			---	---	---	---	---	---	---	---	---	---	
DIISOPROPYL ETHER	108-20-3			---	---	---	---	---	---	---	---	---	---	
ETHYLBENZENE	100-41-4	5800	270	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
HEXACHLOROBUTADIENE	87-68-3	1200	9	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
ISOPROPYLBENZENE	98-82-8	190000	40	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
METHYL BROMIDE	74-83-9			---	4.4 U	4.3 U	7.9 U	---	---	6.9 U	5.4 U	7.4 U	---	
METHYL TERT-BUTYL ETHER	1634-04-4	47000		---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
METHYLENE CHLORIDE	75-09-2	35000	210	---	11 U	10.8 U	19.8 U	---	---	17.2 U	13.6 U	18.5 U	---	
NAPHTHALENE	91-20-3	3800	20000	---	0.0022 U	0.0022 U	0.004 U	---	---	0.0034 U	0.027 U	0.0037 U	---	
N-BUTYL BENZENE	104-51-8	390000		---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
N-PROPYL BENZENE	103-65-1	380000		---	2.2 U	2.2 U	4.0 U	---	---	**1.0 J**	**0.8 J**	3.7 U	---	

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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-101			SB-102	SB-103			SB-104	SB-105	
				SAMPLE ID	SB-101A 0-4	SB-101A 4-6	SB-101A 4-6 Dup	SB-102A 5-7	SB-103A 0-4	SB-103A 0-4 Dup	SB-103A 4-6	SB-104A 5-7	SB-105A 8-10	SB-105A 8-12
				SAMPLE DATE	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11
				QC IDENTIFIER		DUPLICATE	DUPLICATE		DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**HH**	**ECO**											
VOCs (µg/kg)														
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6			---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
SEC-BUTYL BENZENE	135-98-8	780000		---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
STYRENE	100-42-5	600000	1200	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
TERT-AMYL METHYL ETHER	994-05-8			---	---	---	---	---	---	---	---	---	---	
TERT-BUTYL ALCOHOL	75-65-0			---	---	---	---	---	---	---	---	---	---	
TERT-BUTYLBENZENE	98-06-6	780000		---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
TERT-BUTYLETHYL ETHER	637-92-3			---	---	---	---	---	---	---	---	---	---	
TETRACHLOROETHENE	127-18-4	8100	60	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
TETRAHYDROFURAN	109-99-9	1800		---	---	---	---	---	---	---	---	---	---	
TOLUENE	108-88-3	490000	150	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
TRANS-1,3-DICHLOROPROPENE	10061-02-6		398	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
TRANS-1,4-DICHLORO-2-BUTENE	764-41-0			---	---	---	---	---	---	---	---	---	---	
TRICHLOROETHYLENE	79-01-6	410	60	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
VINYL CHLORIDE	75-01-4	59	30	---	4.4 U	4.3 U	7.9 U	---	---	6.9 U	5.4 U	7.4 U	---	
XYLENE O	95-47-6	65000	100	---	2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
XYLENE P,M	179601-23-1		100	---	4.4 U	4.3 U	7.9 U	---	---	6.9 U	5.4 U	7.4 U	---	
TOTAL XYLENES	1330-20-7	58000			2.2 U	2.2 U	4.0 U	---	---	3.4 U	2.7 U	3.7 U	---	
SVOC (µg/kg)														
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	---	---	---	---	---	---	---	---	---	---	
1,2-DICHLOROBENZENE	95-50-1	180000	90	---	---	---	---	---	---	---	---	---	---	
1,3-DICHLOROBENZENE	541-73-1		80	---	---	---	---	---	---	---	---	---	---	
1,4-DICHLOROBENZENE	106-46-7	2600	880	---	---	---	---	---	---	---	---	---	---	
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000		---	---	---	---	---	---	---	---	---	---	
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	---	---	---	---	---	---	---	---	---	---	
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	---	---	---	---	---	---	---	---	---	---	
2,4-DICHLOROPHENOL	120-83-2	19000	20000	---	---	---	---	---	---	---	---	---	---	
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	---	---	---	---	---	---	---	---	---	---	
2,4-DINITROPHENOL	51-28-5	13000	61	---	---	---	---	---	---	---	---	---	---	
2,4-DINITROTOLUENE	121-14-2	1700	6000	---	---	---	---	---	---	---	---	---	---	
2,6-DINITROTOLUENE	606-20-2	360	4000	---	---	---	---	---	---	---	---	---	---	
2-CHLORONAPHTHALENE	91-58-7	480000	12.2	---	---	---	---	---	---	---	---	---	---	
2-CHLOROPHENOL	95-57-8	39000	60	---	---	---	---	---	---	---	---	---	---	
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	---	---	---	---	---	---	---	---	---	---	
2-NITROANILINE	88-74-4	63000	20	---	---	---	---	---	---	---	---	---	---	
2-NITROPHENOL	88-75-5		1600	---	---	---	---	---	---	---	---	---	---	
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	---	---	---	---	---	---	---	---	---	---	
3-NITROANILINE	99-09-2		3160	---	---	---	---	---	---	---	---	---	---	
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	---	---	---	---	---	---	---	---	---	---	
4-BROMOPHENYL PHENYL ETHER	101-55-3			---	---	---	---	---	---	---	---	---	---	
4-CHLORO-3-METHYLPHENOL	59-50-7	630000		---	---	---	---	---	---	---	---	---	---	
4-CHLOROANILINE	106-47-8	2700	1000	---	---	---	---	---	---	---	---	---	---	
4-CHLOROPHENYL PHENYL ETHER	7005-72-3			---	---	---	---	---	---	---	---	---	---	
4-NITROANILINE	100-01-6	25000	21900	---	---	---	---	---	---	---	---	---	---	
4-NITROPHENOL	100-02-7		5120	---	---	---	---	---	---	---	---	---	---	
BENZOIC ACID	65-85-0	25000000	10	---	---	---	---	---	---	---	---	---	---	
BENZYL ALCOHOL	100-51-6	630000	2	---	---	---	---	---	---	---	---	---	---	
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	---	---	---	---	---	---	---	---	---	---	
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000		---	---	---	---	---	---	---	---	---	---	
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230		---	---	---	---	---	---	---	---	---	---	
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20	---	---	---	---	---	---	---	---	---	---	
CARBAZOLE	86-74-8		70	---	---	---	---	---	---	---	---	---	---	
CRESOLS, M- & P-				---	---	---	---	---	---	---	---	---	---	
DIBENZOFURAN	132-64-9	7300	150	---	---	---	---	---	---	---	---	---	---	
DIETHYL PHTHALATE	84-66-2	5100000	250	---	---	---	---	---	---	---	---	---	---	
DIMETHYL PHTHALATE	131-11-3		100000	---	---	---	---	---	---	---	---	---	---	
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	---	---	---	---	---	---	---	---	---	---	

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-101			SB-102	SB-103			SB-104	SB-105	
				SAMPLE ID	SB-101A 0-4	SB-101A 4-6	SB-101A 4-6 Dup	SB-102A 5-7	SB-103A 0-4	SB-103A 0-4 Dup	SB-103A 4-6	SB-104A 5-7	SB-105A 8-10	SB-105A 8-12
				SAMPLE DATE	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11
				QC IDENTIFIER		DUPLICATE	DUPLICATE		DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**HH**	**ECO**											
SVOC (µg/kg)														
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBENZENE	118-74-1	210	79	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROETHANE	67-72-1	1800	24	---	---	---	---	---	---	---	---	---	---	---
ISOPHORONE	78-59-1	570000	139000	---	---	---	---	---	---	---	---	---	---	---
NITROBENZENE	98-95-3	5100	2200	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	---	---	---	---	---	---	---	---	---	---	---
PENTACHLOROPHENOL	87-86-5	1000	2100	---	---	---	---	---	---	---	---	---	---	---
PHENOL	108-95-2	1900000	30000	---	---	---	---	---	---	---	---	---	---	---
PAHs (µg/kg)														
1-METHYLNAPHTHALENE	90-12-0	18000	140	---	---	---	---	---	---	---	---	---	---	---
2-METHYLNAPHTHALENE	91-57-6	24000	110	---	---	---	---	---	---	---	---	---	---	---
ACENAPHTHENE	83-32-9	360000	250	---	---	---	---	---	---	---	---	---	---	---
ACENAPHTHYLENE	208-96-8	360000	340	---	---	---	---	---	---	---	---	---	---	---
ANTHRACENE	120-12-7	1800000	1.5	---	---	---	---	---	---	---	---	---	---	---
BENZO(A)ANTHRACENE	56-55-3	1100	1100	---	---	---	---	---	---	---	---	---	---	---
BENZO(A)PYRENE	50-32-8	110	1100	---	---	---	---	---	---	---	---	---	---	---
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	---	---	---	---	---	---	---	---	---	---	---
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	---	---	---	---	---	---	---	---	---	---	---
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	---	---	---	---	---	---	---	---	---	---	---
CHRYSENE	218-01-9	110000	1100	---	---	---	---	---	---	---	---	---	---	---
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	---	---	---	---	---	---	---	---	---	---	---
FLUORANTHENE	206-44-0	240000	29000	---	---	---	---	---	---	---	---	---	---	---
FLUORENE	86-73-7	240000	30000	---	---	---	---	---	---	---	---	---	---	---
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	---	---	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	2000	160	---	---	---	---	---	---	---	---	---	---	---
PHENANTHRENE	85-01-8	180000	29000	---	---	---	---	---	---	---	---	---	---	---
PYRENE	129-00-0	180000	1100	---	---	---	---	---	---	---	---	---	---	---
TPH (mg/kg)														
TOTAL PETROLEUM HYDROCARBONS				---	---	---	---	---	---	---	---	---	---	---
VPH (µg/kg)														
C5-C8 ALIPHATICS		52000		---	---	---	---	---	---	---	---	---	---	---
C9-C10 AROMATICS		9700		---	---	---	---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS		9600		---	---	---	---	---	---	---	---	---	---	---
EPH (µg/kg)														
C11-C22 AROMATICS		9700		---	---	---	---	---	---	---	---	---	---	---
C11-C22 UNAJUSTED AROMATICS				---	---	---	---	---	---	---	---	---	---	---
C19-C36 ALIPHATICS		23000000		---	---	---	---	---	---	---	---	---	---	---
C9-C18 ALIPHATICS		9600		---	---	---	---	---	---	---	---	---	---	---
PCBs (µg/kg)														
AROCLOR 1016	12674-11-2	410		---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2	200		---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5	170		---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9	230		---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6	230		---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1	120		---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5	240	20	---	---	---	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	120	20	---	---	---	---	---	---	---	---	---	---	---
METALS (mg/kg)														
ALUMINUM	7429-90-5	7700		---	---	---	---	---	---	---	---	---	---	---
ANTIMONY	7440-36-0	3.1	0.27	---	---	---	---	---	---	---	---	---	---	---
ARSENIC	7440-38-2	0.68	18	**3.2**	---	---	---	**3.5**	**3.1**	---	---	---	---	---
BARIUM	7440-39-3	1500	330	**7.2**	---	---	---	**11**	**6.0**	---	---	---	---	---
BERYLLIUM	7440-41-7	16	10	NT	---	---	---	---	---	---	---	---	---	---
CADMIUM	7440-43-9	7.1	0.36	0.5 U	---	---	---	0.5 U	0.5 U	---	---	---	---	---
CALCIUM	7440-70-2			---	---	---	---	---	---	---	---	---	---	---
CHROMIUM	7440-47-3	12000	0.4	**3.6**	---	---	---	**12.3**	**3.0**	---	---	---	---	---

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-101			SB-102	SB-103			SB-104	SB-105	
				SAMPLE ID	SB-101A 0-4	SB-101A 4-6	SB-101A 4-6 Dup	SB-102A 5-7	SB-103A 0-4	SB-103A 0-4 Dup	SB-103A 4-6	SB-104A 5-7	SB-105A 8-10	SB-105A 8-12
				SAMPLE DATE	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11	16-Nov-11
				QC IDENTIFIER		DUPLICATE	DUPLICATE		DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**HH**	**ECO**											
METALS (mg/kg)														
COBALT	7440-48-4	2.3	2.4	---	---	---	---	---	---	---	---	---	---	---
COPPER	7440-50-8	310	28	---	---	---	---	---	---	---	---	---	---	---
IRON	7439-89-6	5500		---	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	400	11	**2.6 J**	---	---	---	---	**32.8**	**5.0 J**	---	---	---	---
MAGNESIUM	7439-95-4			---	---	---	---	---	---	---	---	---	---	---
MANGANESE	7439-96-5	180	220	---	---	---	---	---	---	---	---	---	---	---
MERCURY	7439-97-6	2.3	0.013	0.034 U	---	---	---	---	**0.010 J**	0.035 U	---	---	---	---
NICKEL	7440-02-0	150	38	---	---	---	---	---	---	---	---	---	---	---
POTASSIUM	7440-09-7			---	---	---	---	---	---	---	---	---	---	---
SELENIUM	7782-49-2	39	0.52	4.6 U	---	---	---	---	5.2 U	5.0 U	---	---	---	---
SILVER	7440-22-4	39	4.2	0.5 U	---	---	---	---	0.5 U	0.5 U	---	---	---	---
SODIUM	7440-23-5			---	---	---	---	---	---	---	---	---	---	---
THALLIUM	7440-28-0	0.078	0.22	---	---	---	---	---	---	---	---	---	---	---
VANADIUM	7440-62-2	39	2	---	---	---	---	---	---	---	---	---	---	---
ZINC	7440-66-6	2300	46	---	---	---	---	---	---	---	---	---	---	---
TOC (mg/kg)														
TOTAL ORGANIC CARBON				**4220**	---	---	---			---	---	---	**1050**	

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efro
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-107	SB-108						SB-301			
				SAMPLE ID	SB107A 7-9	SB-108A 0-4	SB-108A 0-4 (2)	SB-108A 4-8	SB-108A 10-12	SB-108A 10-14	SB-108A 8-12	SB-301-CI19-0-1	SB-301-CI19-0-1-DUP	SB-301-CI19-1-3	SB-301-CI19-1-3-DUP
				SAMPLE DATE	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19
				QC IDENTIFIER		DUPLICATE	DUPLICATE					DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE
ANALYTE	**CAS**	**HH**	**ECO**												
VOCs (µg/kg)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHAN	76-13-1	670000		---	---	---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	320	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	140	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	40	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6			5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	1230	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	400	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	280	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1		80	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000		5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
1,4-DIOXANE	123-91-1			---	---	---	---	---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7			5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	1000	53.2 U	50 U	---	41.3 U	44.3 U	---	---	---	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000		5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
2-HEXANONE	591-78-6	20000	360	53.2 U	50 U	---	41.3 U	44.3 U	---	---	---	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000		5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	10	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	53.2 U	50 U	---	41.3 U	44.3 U	---	---	---	---	---	---	---
ACETONE	67-64-1	6100000	40	53.2 U	50 U	---	41.3 U	44.3 U	---	---	---	---	---	---	---
ACRYLONITRILE	107-13-1			---	---	---	---	---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	120	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
BROMOBENZENE	108-86-1	29000		5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
BROMOMETHANE	74-83-9			10.6 U	10 U	---	8.3 U	8.9 U	---	---	---	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000		5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	540	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
BROMOFORM	75-25-2	19000	70	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	5	**4.8 J**	**1.6 J**	---	4.1 U	**3.6 J**	---	---	---	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	50	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
CHLOROBENZENE	108-90-7	28000	2400	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
CHLOROETHANE	75-00-3	1400000		10.6 U	10 U	---	8.3 U	8.9 U	---	---	---	---	---	---	---
CHLOROFORM	67-66-3	320	50	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
CHLOROMETHANE	74-87-3	11000	10400	10.6 U	10 U	---	8.3 U	8.9 U	---	---	---	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5		398	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300		5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	65000	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	10.6 U	10 U	---	8.3 U	8.9 U	---	---	---	---	---	---	---
DIETHYLETHER	60-29-7			---	---	---	---	---	---	---	---	---	---	---	---
DIISOPROPYL ETHER	108-20-3			---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
HEXACHLOROBUTADIENE	87-68-3	1200	9	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	40	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
METHYL BROMIDE	74-83-9			10.6 U	10 U	---	8.3 U	8.9 U	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000		5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
METHYLENE CHLORIDE	75-09-2	35000	210	26.6 U	25 U	---	20.7 U	22.2 U	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	3800	20000	0.0053 U	0.005 U	---	0.0041 U	0.0044 U	---	---	---	---	---	---	---
N-BUTYL BENZENE	104-51-8	390000		5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000		5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-107	SB-108					SB-301			
				SAMPLE ID	SB107A 7-9	SB-108A 0-4	SB-108A 0-4 (2)	SB-108A 4-8	SB-108A 10-12	SB-108A 10-14	SB-108A 8-12	SB-301-CI19-0-1	SB-301-CI19-0-1-DUP	SB-301-CI19-1-3	SB-301-CI19-1-3-DUP
				SAMPLE DATE	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19
				QC IDENTIFIER		DUPLICATE	DUPLICATE					DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE
ANALYTE	**CAS**	**HH**	**ECO**												
VOCs (µg/kg)															
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6			5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000		5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
STYRENE	100-42-5	600000	1200	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
TERT-AMYL METHYL ETHER	994-05-8			---	---	---	---	---	---	---	---	---	---	---	---
TERT-BUTYL ALCOHOL	75-65-0			---	---	---	---	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000		5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
TERT-BUTYLETHYL ETHER	637-92-3			---	---	---	---	---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
TETRAHYDROFURAN	109-99-9	1800		---	---	---	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	490000	150	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6		398	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
TRANS-1,4-DICHLORO-2-BUTENE	764-41-0			---	---	---	---	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
VINYL CHLORIDE	75-01-4	59	30	10.6 U	10 U	---	8.3 U	8.9 U	---	---	---	---	---	---	---
XYLENE O	95-47-6	65000	100	5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
XYLENE P,M	179601-23-1		100	10.6 U	10 U	---	8.3 U	8.9 U	---	---	---	---	---	---	---
TOTAL XYLENES	1330-20-7	58000		5.3 U	5.0 U	---	4.1 U	4.4 U	---	---	---	---	---	---	---
SVOC (µg/kg)															
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
1,2-DICHLOROBENZENE	95-50-1	180000	90	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
1,3-DICHLOROBENZENE	541-73-1		80	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
1,4-DICHLOROBENZENE	106-46-7	2600	880	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000		---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	---	---	---	---	---	---	---	---	630 U	640 U	620 U	630 U
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
2,4-DICHLOROPHENOL	120-83-2	19000	20000	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
2,4-DINITROPHENOL	51-28-5	13000	61	---	---	---	---	---	---	---	---	630 U	640 U	620 U	630 U
2,4-DINITROTOLUENE	121-14-2	1700	6000	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
2,6-DINITROTOLUENE	606-20-2	360	4000	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
2-CHLORONAPHTHALENE	91-58-7	480000	12.2	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
2-CHLOROPHENOL	95-57-8	39000	60	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
2-NITROANILINE	88-74-4	63000	20	---	---	---	---	---	---	---	---	630 U	640 U	620 U	630 U
2-NITROPHENOL	88-75-5		1600	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	---	---	---	---	---	---	---	---	250 UJ	260 UJ	250 UJ	260 UJ
3-NITROANILINE	99-09-2		3160	---	---	---	---	---	---	---	---	630 U	640 U	620 U	630 U
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	---	---	---	---	---	---	---	---	630 U	640 U	620 U	630 U
4-BROMOPHENYL PHENYL ETHER	101-55-3			---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
4-CHLORO-3-METHYLPHENOL	59-50-7	630000		---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
4-CHLOROANILINE	106-47-8	2700	1000	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
4-CHLOROPHENYL PHENYL ETHER	7005-72-3			---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
4-NITROANILINE	100-01-6	25000	21900	---	---	---	---	---	---	---	---	630 U	640 U	620 U	630 U
4-NITROPHENOL	100-02-7		5120	---	---	---	---	---	---	---	---	630 U	640 U	620 U	630 U
BENZOIC ACID	65-85-0	25000000	10	---	---	---	---	---	---	---	---	**7800 J**	**2100 J**	620 U	630 U
BENZYL ALCOHOL	100-51-6	630000	2	---	---	---	---	---	---	---	---	510 U	510 U	500 U	510 U
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000		---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230		---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
CARBAZOLE	86-74-8		70	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
CRESOLS, M- & P-				---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
DIBENZOFURAN	132-64-9	7300	150	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
DIETHYL PHTHALATE	84-66-2	5100000	250	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
DIMETHYL PHTHALATE	131-11-3		100000	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	---	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-107	SB-108						SB-301			
				SAMPLE ID	SB107A 7-9	SB-108A 0-4	SB-108A 0-4 (2)	SB-108A 4-8	SB-108A 10-12	SB-108A 10-14	SB-108A 8-12	SB-301-CI19-0-1	SB-301-CI19-0-1-DUP	SB-301-CI19-1-3	SB-301-CI19-1-3-DUP
				SAMPLE DATE	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19
				QC IDENTIFIER		DUPLICATE	DUPLICATE					DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE
ANALYTE	**CAS**	**HH**	**ECO**												
SVOC (µg/kg)															
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
HEXACHLOROBENZENE	118-74-1	210	79	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
HEXACHLOROETHANE	67-72-1	1800	24	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
ISOPHORONE	78-59-1	570000	139000	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
NITROBENZENE	98-95-3	5100	2200	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
PENTACHLOROPHENOL	87-86-5	1000	2100	---	---	---	---	---	---	---	630 U	640 U	620 U	630 U
PHENOL	108-95-2	1900000	30000	---	---	---	---	---	---	---	250 U	260 U	250 U	260 U
PAHs (µg/kg)															
1-METHYLNAPHTHALENE	90-12-0	18000	140	---	---	---	---	---	---	---	**6.4 J**	**5.1 J**	**6.4 J**	**11 J**
2-METHYLNAPHTHALENE	91-57-6	24000	110	---	---	---	---	---	---	---	**11 J**	**7.9 J**	**12 J**	**19 J**
ACENAPHTHENE	83-32-9	360000	250	---	---	---	---	---	---	---	**40**	**31**	10 U	10 U
ACENAPHTHYLENE	208-96-8	360000	340	---	---	---	---	---	---	---	10 U	10 U	10 U	10 U
ANTHRACENE	120-12-7	1800000	1.5	---	---	---	---	---	---	---	**72**	**59**	10 U	**3.3 J**
BENZO(A)ANTHRACENE	56-55-3	1100	1100	---	---	---	---	---	---	---	**190**	**210**	20 U	21 U
BENZO(A)PYRENE	50-32-8	110	1100	---	---	---	---	---	---	---	**140**	**200**	20 U	**22**
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	---	---	---	---	---	---	---	**200**	**270**	20 U	**36**
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	---	---	---	---	---	---	---	**110**	**150**	**21**	**24**
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	---	---	---	---	---	---	---	**97**	**130**	**8.2 J**	**16 J**
CHRYSENE	218-01-9	110000	1100	---	---	---	---	---	---	---	**200**	**240**	20 U	21 U
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	---	---	---	---	---	---	---	**39**	**54**	**5.8 J**	10 U
FLUORANTHENE	206-44-0	240000	29000	---	---	---	---	---	---	---	**270**	**320**	20 U	21 U
FLUORENE	86-73-7	240000	30000	---	---	---	---	---	---	---	**41**	**29**	10 U	10 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	---	---	---	---	---	---	---	**110**	**130**	**19 J**	**18 J**
NAPHTHALENE	91-20-3	2000	160	---	---	---	---	---	---	---	**13 J**	10 U	10 U	**14 J**
PHENANTHRENE	85-01-8	180000	29000	---	---	---	---	---	---	---	**350**	**300**	**13 J**	**27**
PYRENE	129-00-0	180000	1100	---	---	---	---	---	---	---	**410 J**	**410 J**	**10 J**	**32**
TPH (mg/kg)															
TOTAL PETROLEUM HYDROCARBONS				---	---	---	---	---	---	---	---	---	---	---	---
VPH (µg/kg)															
C5-C8 ALIPHATICS		52000		---	---	---	---	---	---	---	---	---	---	---	---
C9-C10 AROMATICS		9700		---	---	---	---	---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS		9600		---	---	---	---	---	---	---	---	---	---	---	---
EPH (µg/kg)															
C11-C22 AROMATICS		9700		---	---	---	---	---	---	---	---	---	---	---	---
C11-C22 UNAJUSTED AROMATICS				---	---	---	---	---	---	---	---	---	---	---	---
C19-C36 ALIPHATICS		23000000		---	---	---	---	---	---	---	---	---	---	---	---
C9-C18 ALIPHATICS		9600		---	---	---	---	---	---	---	---	---	---	---	---
PCBs (µg/kg)															
AROCLOR 1016	12674-11-2	410		---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2	200		---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5	170		---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9	230		---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6	230		---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1	120		---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5	240	20	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	120	20	---	---	---	---	---	---	---	---	---	---	---	---
METALS (mg/kg)															
ALUMINUM	7429-90-5	7700		---	---	---	---			---	**5360**	**5810**	**4690**	**4540**
ANTIMONY	7440-36-0	3.1	0.27	---	---	---	---			---	**0.074**	**0.11**	**0.10**	**0.11**
ARSENIC	7440-38-2	0.68	18	---	**4.0**	**2.4 J**	**1.6 J**			**2.50**	**1.69**	**1.69**	**1.24**	**1.32**
BARIUM	7440-39-3	1500	330	---	**9.3**	**5.0**	**4.9**			**4.50**	**15.8**	**18.9**	**14.3**	**13.2**
BERYLLIUM	7440-41-7	16	10	---	---	---	---			---	**0.499**	**0.499**	**0.385**	**0.41**
CADMIUM	7440-43-9	7.1	0.36	---	0.5 U	**0.2 J**	0.5 U			**0.100 J**	**2.50**	**2.82**	**2.40**	**2.68**
CALCIUM	7440-70-2			---	---	---	---			---	**423**	**470**	**337**	**354**
CHROMIUM	7440-47-3	12000	0.4	---	**3.3**	**1.7**	**0.8 J**			**1.4**	**13.0**	**12.1**	**14.9**	**13.9**

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-107	SB-108						SB-301			
				SAMPLE ID	SB107A 7-9	SB-108A 0-4	SB-108A 0-4 (2)	SB-108A 4-8	SB-108A 10-12	SB-108A 10-14	SB-108A 8-12	SB-301-CI19-0-1	SB-301-CI19-0-1-DUP	SB-301-CI19-1-3	SB-301-CI19-1-3-DUP
				SAMPLE DATE	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	18-Nov-11	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19
				QC IDENTIFIER		DUPLICATE	DUPLICATE					DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE
ANALYTE	**CAS**	**HH**	**ECO**												
METALS (mg/kg)															
COBALT	7440-48-4	2.3	2.4	---	---	---	---	---	---	---	---	**2.60**	**2.76**	**2.18**	**1.95**
COPPER	7440-50-8	310	28	---	---	---	---	---	---	---	---	**8.90**	**9.90**	**8.91**	**7.08**
IRON	7439-89-6	5500		---	---	---	---	---	---	---	---	**8130**	**8650**	**6360**	**6880**
LEAD	7439-92-1	400	11	---	**3.6 J**	**1.9 J**	**1.6 J**	---	---	---	**1.70 J**	**123**	**98.8**	**96.8**	**106**
MAGNESIUM	7439-95-4			---	---	---	---	---	---	---	---	**1240**	**1380**	**908**	**768**
MANGANESE	7439-96-5	180	220	---	---	---	---	---	---	---	---	**99.0**	**116**	**59.8**	**63.0**
MERCURY	7439-97-6	2.3	0.013	---	0.030 U	0.030 U	0.033 U	---	---	---	0.034 U	**0.014 J**	**0.019 J**	**0.013 J**	**0.012 J**
NICKEL	7440-02-0	150	38	---	---	---	---	---	---	---	---	**5.56**	**5.79**	**4.48**	**4.22**
POTASSIUM	7440-09-7			---	---	---	---	---	---	---	---	**582**	**648**	**392**	**363**
SELENIUM	7782-49-2	39	0.52	---	5.1 U	4.9 U	5.0 U	---	---	---	4.8 U	**0.10 J**	**0.11 J**	**0.085 J**	**0.098 J**
SILVER	7440-22-4	39	4.2	---	0.5 U	0.5 U	0.5 U	---	---	---	0.5 U	**0.0644 J**	**0.0744 J**	**0.0393 J**	**0.039 J**
SODIUM	7440-23-5			---	---	---	---	---	---	---	---	74 U	82 U	53 U	63 U
THALLIUM	7440-28-0	0.078	0.22	---	---	---	---	---	---	---	---	**0.0873**	**0.0867**	**0.0554**	**0.051 J**
VANADIUM	7440-62-2	39	2	---	---	---	---	---	---	---	---	**8.99**	**9.20**	**8.13**	**7.20**
ZINC	7440-66-6	2300	46	---	---	---	---	---	---	---	---	**39.0**	**45.9**	**59.1 J**	**32.9 J**
TOC (mg/kg)															
TOTAL ORGANIC CARBON				---	---	---	---	---	---	**1060**	---	**23000**	**22000**	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efro
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	SB-302		SB-303		SB-304		SB-305		SB-306		SB-307	
			SAMPLE ID	SB-302-CI19-0-1	SB-302-CI19-1-3	SB-303-CI19-0-1	SB-303-CI19-1-3	SB-304-CI19-0-1	SB-304-CI19-1-3	SB-305-CI19-0-1	SB-305-CI19-1-3	SB-306-CI19-0-1	SB-306-CI19-1-3	SB-307-CI19-0-1	SB-307-CI19-1-3
			SAMPLE DATE	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	7-Oct-19	7-Oct-19
			QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**												
VOCs (µg/kg)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHAN	76-13-1	670000		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,1,2-TRICHLOROETHANE	79-00-5	150	320	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,1-DICHLOROETHANE	75-34-3	3600	140	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,1-DICHLOROETHENE	75-35-4	23000	40	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,1-DICHLOROPROPENE	563-58-6			---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,2-DIBROMOETHANE	106-93-4	36	1230	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,2-DICHLOROBENZENE	95-50-1	180000	90	---	---	---	---	---	---	---	---	---	---	260 U	2.5 U
1,2-DICHLOROETHANE	107-06-2	460	400	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,2-DICHLOROPROPANE	78-87-5	1600	280	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,3-DICHLOROBENZENE	541-73-1		80	---	---	---	---	---	---	---	---	---	---	260 U	250 U
1,3-DICHLOROPROPANE	142-28-9	160000		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
1,4-DICHLOROBENZENE	106-46-7	2600	880	---	---	---	---	---	---	---	---	---	---	260 U	2.5 U
1,4-DIOXANE	123-91-1			---	---	---	---	---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7			---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
2-BUTANONE (MEK)	78-93-3	2700000	1000	---	---	---	---	---	---	---	---	---	---	12 U	12 U
2-CHLOROTOLUENE	95-49-8	160000		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
2-HEXANONE	591-78-6	20000	360	---	---	---	---	---	---	---	---	---	---	12 U	12 U
4-CHLOROTOLUENE	106-43-4	160000		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
4-ISOPROPYLTOLUENE	99-87-6	190000	10	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	---	---	---	---	---	---	---	---	---	---	12 U	12 U
ACETONE	67-64-1	6100000	40	---	---	---	---	---	---	---	---	---	---	12 U	**32**
ACRYLONITRILE	107-13-1			---	---	---	---	---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	120	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
BROMOBENZENE	108-86-1	29000		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
BROMOMETHANE	74-83-9			---	---	---	---	---	---	---	---	---	---	5.0 U	5.0 U
BROMOCHLOROMETHANE	74-97-5	15000		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
BROMODICHLOROMETHANE	75-27-4	290	540	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
BROMOFORM	75-25-2	19000	70	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
CARBON DISULFIDE	75-15-0	77000	5	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
CARBON TETRACHLORIDE	56-23-5	650	50	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
CHLOROBENZENE	108-90-7	28000	2400	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
CHLOROETHANE	75-00-3	1400000		---	---	---	---	---	---	---	---	---	---	5.0 U	5.0 U
CHLOROFORM	67-66-3	320	50	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
CHLOROMETHANE	74-87-3	11000	10400	---	---	---	---	---	---	---	---	---	---	5.0 U	5.0 U
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
CIS-1,3-DICHLOROPROPENE	10061-01-5		398	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
DIBROMOCHLOROMETHANE	124-48-1	8300		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
DIBROMOMETHANE	74-95-3	2400	65000	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	---	---	---	---	---	---	---	---	---	---	5.0 U	5.0 U
DIETHYLETHER	60-29-7			---	---	---	---	---	---	---	---	---	---	---	---
DIISOPROPYL ETHER	108-20-3			---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
HEXACHLOROBUTADIENE	87-68-3	1200	9	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
ISOPROPYLBENZENE	98-82-8	190000	40	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
METHYL BROMIDE	74-83-9			---	---	---	---	---	---	---	---	---	---	5.0 U	5.0 U
METHYL TERT-BUTYL ETHER	1634-04-4	47000		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
METHYLENE CHLORIDE	75-09-2	35000	210	---	---	---	---	---	---	---	---	---	---	12 U	12 U
NAPHTHALENE	91-20-3	3800	20000	---	---	---	---	---	---	---	---	---	---	10 U	10 U
N-BUTYL BENZENE	104-51-8	390000		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
N-PROPYL BENZENE	103-65-1	380000		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	SB-302		SB-303		SB-304		SB-305		SB-306		SB-307	
			SAMPLE ID	SB-302-CI19-0-1	SB-302-CI19-1-3	SB-303-CI19-0-1	SB-303-CI19-1-3	SB-304-CI19-0-1	SB-304-CI19-1-3	SB-305-CI19-0-1	SB-305-CI19-1-3	SB-306-CI19-0-1	SB-306-CI19-1-3	SB-307-CI19-0-1	SB-307-CI19-1-3
			SAMPLE DATE	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	7-Oct-19	7-Oct-19
			QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**												
VOCs (µg/kg)															
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6			---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
SEC-BUTYL BENZENE	135-98-8	780000		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
STYRENE	100-42-5	600000	1200	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
TERT-AMYL METHYL ETHER	994-05-8			---	---	---	---	---	---	---	---	---	---	---	---
TERT-BUTYL ALCOHOL	75-65-0			---	---	---	---	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
TERT-BUTYLETHYL ETHER	637-92-3			---	---	---	---	---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60	---	---	---	---	---	---	---	---	---	---	2.5 U	**3.7 J**
TETRAHYDROFURAN	109-99-9	1800		---	---	---	---	---	---	---	---	---	---	12 U	12 U
TOLUENE	108-88-3	490000	150	---	---	---	---	---	---	---	---	---	---	2.5 U	**1.9 J**
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
TRANS-1,3-DICHLOROPROPENE	10061-02-6		398	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
TRANS-1,4-DICHLORO-2-BUTENE	764-41-0			---	---	---	---	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60	---	---	---	---	---	---	---	---	---	---	**4.1 J**	**21**
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	---	---	---	---	---	---	---	---	---	---	5.0 U	5.0 U
VINYL CHLORIDE	75-01-4	59	30	---	---	---	---	---	---	---	---	---	---	5.0 U	5.0 U
XYLENE O	95-47-6	65000	100	---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
XYLENE P,M	179601-23-1		100	---	---	---	---	---	---	---	---	---	---	5.0 U	5.0 U
TOTAL XYLENES	1330-20-7	58000		---	---	---	---	---	---	---	---	---	---	2.5 U	2.5 U
SVOC (µg/kg)															
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	2.5 U	2.5 U
1,2-DICHLOROBENZENE	95-50-1	180000	90	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	2.5 U
1,3-DICHLOROBENZENE	541-73-1		80	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
1,4-DICHLOROBENZENE	106-46-7	2600	880	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	2.5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	630 U	630 U	650 U	630 U	700 U	640 U	650 U	640 U	630 U	620 U	640 U	630 U
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
2,4-DICHLOROPHENOL	120-83-2	19000	20000	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
2,4-DINITROPHENOL	51-28-5	13000	61	630 U	630 U	650 U	630 U	700 U	640 U	650 U	640 U	630 U	620 U	640 U	630 U
2,4-DINITROTOLUENE	121-14-2	1700	6000	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
2,6-DINITROTOLUENE	606-20-2	360	4000	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
2-CHLORONAPHTHALENE	91-58-7	480000	12.2	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
2-CHLOROPHENOL	95-57-8	39000	60	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
2-NITROANILINE	88-74-4	63000	20	630 U	630 U	650 U	630 U	700 U	640 U	650 U	640 U	630 U	620 U	640 U	630 U
2-NITROPHENOL	88-75-5		1600	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	---	260 UJ	260 UJ	---	280 UJ	260 UJ	260 UJ	260 UJ	250 UJ	250 UJ	260 U	250 U
3-NITROANILINE	99-09-2		3160	630 UJ	630 U	650 U	630 U	700 U	640 U	650 U	640 U	630 U	620 U	640 U	630 U
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	630 U	630 U	650 U	630 U	700 U	640 U	650 U	640 U	630 U	620 U	640 U	630 U
4-BROMOPHENYL PHENYL ETHER	101-55-3			250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
4-CHLORO-3-METHYLPHENOL	59-50-7	630000		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
4-CHLOROANILINE	106-47-8	2700	1000	250 U	260 U	260 U	260 UJ	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
4-CHLOROPHENYL PHENYL ETHER	7005-72-3			250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
4-NITROANILINE	100-01-6	25000	21900	630 UJ	630 U	650 U	630 U	700 U	640 U	650 U	640 U	630 U	620 U	640 U	630 U
4-NITROPHENOL	100-02-7		5120	630 U	630 U	650 U	630 U	700 U	640 U	650 U	640 U	630 U	620 U	640 U	630 U
BENZOIC ACID	65-85-0	25000000	10	630 U	630 U	650 U	630 U	700 U	640 U	650 U	640 U	630 U	620 U	640 U	630 U
BENZYL ALCOHOL	100-51-6	630000	2	500 U	510 U	520 U	510 U	570 U	510 U	520 U	510 U	500 U	500 U	520 U	510 U
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20	**220 J**	260 U	260 U	260 U	280 U	260 U	**200 J**	260 U	250 U	250 U	260 U	250 U
CARBAZOLE	86-74-8		70	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
CRESOLS, M- & P-				250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
DIBENZOFURAN	132-64-9	7300	150	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
DIETHYL PHTHALATE	84-66-2	5100000	250	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
DIMETHYL PHTHALATE	131-11-3		100000	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U

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North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-302		SB-303		SB-304		SB-305		SB-306		SB-307	
				SAMPLE ID	SB-302-CI19-0-1	SB-302-CI19-1-3	SB-303-CI19-0-1	SB-303-CI19-1-3	SB-304-CI19-0-1	SB-304-CI19-1-3	SB-305-CI19-0-1	SB-305-CI19-1-3	SB-306-CI19-0-1	SB-306-CI19-1-3	SB-307-CI19-0-1	SB-307-CI19-1-3
				SAMPLE DATE	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**													
SVOC (µg/kg)																
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
HEXACHLOROBENZENE	118-74-1	210	79		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
HEXACHLOROETHANE	67-72-1	1800	24		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
ISOPHORONE	78-59-1	570000	139000		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
NITROBENZENE	98-95-3	5100	2200		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
N-NITROSODIPHENYLAMINE	86-30-6	110000	545		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
PENTACHLOROPHENOL	87-86-5	1000	2100		630 U	630 U	650 U	630 U	700 U	640 U	650 U	640 U	630 U	620 U	640 U	630 U
PHENOL	108-95-2	1900000	30000		250 U	260 U	260 U	260 U	280 U	260 U	260 U	260 U	250 U	250 U	260 U	250 U
PAHs (µg/kg)																
1-METHYLNAPHTHALENE	90-12-0	18000	140		**3.8 J**	**2.1 J**	**5.0 J**	**6.4 J**	**3.0 J**	**7.2 J**	11 U	---	**2.2 J**	10 UJ	**3.8 J**	**3.1 J**
2-METHYLNAPHTHALENE	91-57-6	24000	110		**6.7 J**	**2.6 J**	**4.7 J**	**11 J**	**4.2 J**	**9.2 J**	**2.4 J**	**2.7 J**	**3.3 J**	10 UJ	**5.2 J**	**4.7 J**
ACENAPHTHENE	83-32-9	360000	250		10 U	10 U	11 U	10 U	11 U	10 U	11 U	---	10 U	10 UJ	10 U	10 U
ACENAPHTHYLENE	208-96-8	360000	340		10 U	10 U	11 U	10 U	11 U	10 U	11 U	---	10 U	10 UJ	10 U	10 U
ANTHRACENE	120-12-7	1800000	1.5		**5.4 J**	10 U	**3.7 J**	**5.0 J**	11 U	**18 J**	**38**	**6.3 J**	**3.3 J**	10 UJ	**3.3 J**	**14 J**
BENZO(A)ANTHRACENE	56-55-3	1100	1100		**52 J**	21 U	**38**	**65**	**75**	**140**	**220**	**42 J**	**34**	10 UJ	**35**	**64**
BENZO(A)PYRENE	50-32-8	110	1100		**71 J**	21 U	**54**	**95 J**	**110**	**130**	**280**	21 UJ	**45**	20 U	**50**	**62**
BENZO(B)FLUORANTHENE	205-99-2	1100	1100		**140 J**	21 U	**60**	**260 J**	**180**	**220**	**360**	**32 J**	**67**	20 U	**79**	**93**
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100		**76 J**	**5.3 J**	**37**	**66 J**	**100**	**100**	**180**	---	**35**	10 UJ	**37**	**36**
BENZO(K)FLUORANTHENE	207-08-9	11000	1100		**52**	**8.3 J**	**25**	**76 J**	**67**	**93**	**140**	**18 J**	**30**	**5.8 J**	**36**	**42**
CHRYSENE	218-01-9	110000	1100		**79 J**	21 U	**64**	**94 J**	**150**	**200**	**340**	**34 J**	**50**	20 U	**60**	**73**
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60		**22 J**	10 U	**7.1 J**	**17 J**	**21 J**	**33**	**53**	**3.6 J**	**7.0 J**	10 UJ	**8.4 J**	**12 J**
FLUORANTHENE	206-44-0	240000	29000		**51 J**	21 U	**50**	**57 J**	**220**	**170**	**610 J**	**58 J**	**64**	20 U	**63**	**110**
FLUORENE	86-73-7	240000	30000		10 U	10 U	**3.5 J**	10 U	11 U	**6.8 J**	**12 J**	**3.9 J**	10 U	10 UJ	10 U	**5.8 J**
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100		**51 J**	10 U	**34**	**53 J**	**100**	**110**	**180**	---	**30**	10 UJ	**46**	**41**
NAPHTHALENE	91-20-3	2000	160		10 U	10 U	11 U	**11 J**	11 U	10 U	11 U	---	10 U	10 UJ	10 U	10 U
PHENANTHRENE	85-01-8	180000	29000		**40 J**	**13 J**	**53**	**43 J**	**92**	**98**	**370**	**37 J**	**28**	10 UJ	**41**	**78**
PYRENE	129-00-0	180000	1100		**130 J**	**6.7 J**	**85**	**100 J**	**190**	**170**	**500 J**	**8.6 J**	**56**	**4.5 J**	**57**	**81**
TPH (mg/kg)																
TOTAL PETROLEUM HYDROCARBONS					---	---	---	---	---	---	---	---	---	---	---	---
VPH (µg/kg)																
C5-C8 ALIPHATICS		52000			---	---	---	---	---	---	---	---	---	---	---	---
C9-C10 AROMATICS		9700			---	---	---	---	---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS		9600			---	---	---	---	---	---	---	---	---	---	---	---
EPH (µg/kg)																
C11-C22 AROMATICS		9700			---	---	---	---	---	---	---	---	---	---	---	---
C11-C22 UNAJUSTED AROMATICS					---	---	---	---	---	---	---	---	---	---	---	---
C19-C36 ALIPHATICS		23000000			---	---	---	---	---	---	---	---	---	---	---	---
C9-C18 ALIPHATICS		9600			---	---	---	---	---	---	---	---	---	---	---	---
PCBs (µg/kg)																
AROCLOR 1016	12674-11-2	410			---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2	200			---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5	170			---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9	230			---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6	230			---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1	120			---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5	240	20		---	---	---	---	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	120	20		---	---	---	---	---	---	---	---	---	---	---	---
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700			**4700**	**3800**	**8100**	**4890**	**5910**	**5600**	**5260**	**6020**	**5400**	**4020**	**3590**	**4040**
ANTIMONY	7440-36-0	3.1	0.27		**0.400 J**	**0.036 J**	**0.097**	**0.14 J**	**0.140**	**0.179**	**0.312**	**0.212**	**0.264**	**0.13**	**0.070 J**	**0.084**
ARSENIC	7440-38-2	0.68	18		**1.91**	**1.08**	**4.39**	**2.09**	**2.14**	**3.32**	**1.68**	**2.12**	**1.90**	**1.30**	**1.30**	**1.37**
BARIUM	7440-39-3	1500	330		**20.4**	**9.25**	**23.0**	**15.3**	**10.5**	**16.6**	**11.4**	**15.2**	**10.7**	**9.26**	**12.6**	**12.8**
BERYLLIUM	7440-41-7	16	10		**0.382**	**0.469**	**0.526**	**0.42**	**0.518**	**0.485**	**0.49**	**0.482**	**0.458**	**0.376**	**0.358**	**0.369**
CADMIUM	7440-43-9	7.1	0.36		**1.16**	**0.0921**	**0.160**	**0.303**	**0.747**	**2.83**	**1.26**	**2.39**	**0.565**	**1.53**	**0.227**	**0.411**
CALCIUM	7440-70-2				**391 J**	**308**	**579**	**432 J**	**367**	**402**	**426**	**404**	**419**	**228**	**300**	**436**
CHROMIUM	7440-47-3	12000	0.4		**12.9**	**3.91**	**9.14**	**9.19**	**8.19**	**9.82**	**12.4**	**12.4**	**9.09**	**5.38**	**4.45**	**5.00**

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-302		SB-303		SB-304		SB-305		SB-306		SB-307	
				SAMPLE ID	SB-302-CI19-0-1	SB-302-CI19-1-3	SB-303-CI19-0-1	SB-303-CI19-1-3	SB-304-CI19-0-1	SB-304-CI19-1-3	SB-305-CI19-0-1	SB-305-CI19-1-3	SB-306-CI19-0-1	SB-306-CI19-1-3	SB-307-CI19-0-1	SB-307-CI19-1-3
				SAMPLE DATE	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**													
METALS (mg/kg)																
COBALT	7440-48-4	2.3	2.4		**2.32**	**1.99**	**3.72**	**2.41**	**4.14**	**3.12**	**3.18**	**3.07**	**3.01**	**2.81**	**1.84**	**2.22**
COPPER	7440-50-8	310	28		**31.1 J**	**4.61**	**11.4**	**13.3**	**16.9**	**17.9**	**25.2**	**25.5**	**16.8**	**26.9**	**6.04**	**7.49**
IRON	7439-89-6	5500			**8090**	**6200**	**10600**	**8380**	**10700**	**9080**	**9370**	**9010**	**9320**	**7130**	**5880**	**6540**
LEAD	7439-92-1	400	11		**383**	**5.92**	**51.8**	**129**	**22.1**	**28.1**	**27.8**	**31.6**	**32.7**	**20.1**	**70.0**	**34.5**
MAGNESIUM	7439-95-4				**1040**	**758**	**1710**	**929 J**	**1780**	**1220**	**1270**	**1340**	**1250**	**989**	**730**	**849**
MANGANESE	7439-96-5	180	220		**82.0 J**	**95.5**	**131**	**91.1 J**	**119**	**103**	**101**	**104**	**108**	**92.6**	**70.9**	**90.2**
MERCURY	7439-97-6	2.3	0.013		**0.016 J**	**0.017 U**	**0.018 J**	**0.026 J**	**0.041**	**0.126**	**0.045**	**0.0544**	**0.048**	**0.042**	**0.013 J**	**0.013 J**
NICKEL	7440-02-0	150	38		**6.05**	**3.34**	**7.37**	**5.43**	**12.5**	**6.30**	**9.96**	**6.96**	**6.53**	**5.47**	**3.51**	**4.37**
POTASSIUM	7440-09-7				**416**	**332**	**639**	**484**	**539**	**742**	**479**	**516**	**528**	**436**	**445**	**369**
SELENIUM	7782-49-2	39	0.52		**0.08 J**	**0.096 J**	**0.20 J**	**0.10 J**	**0.12 J**	**0.15 J**	**0.10 J**	**0.14 J**	**0.12 J**	**0.073 J**	**0.094 J**	**0.10 J**
SILVER	7440-22-4	39	4.2		**11.5 J**	**0.017 J**	**0.0508 J**	**0.107**	**0.103**	**0.128**	**0.134**	**0.293**	**0.143**	**0.102**	**0.031 J**	**0.045 J**
SODIUM	7440-23-5				87 U	66 U	72 U	77 U	95 U	82 U	67 U	62 U	**82.6**	83 U	**22 J**	**24.3 J**
THALLIUM	7440-28-0	0.078	0.22		**0.066 J**	**0.061 J**	**0.119**	**0.072 J**	**0.082 J**	**0.102**	**0.0648 J**	**0.0786**	**0.0745**	**0.062 J**	**0.067 J**	**0.059 J**
VANADIUM	7440-62-2	39	2		**7.61**	**4.42**	**12.3**	**7.81 J**	**8.12**	**7.76**	**7.21**	**8.38**	**7.52**	**4.93**	**5.53**	**5.89**
ZINC	7440-66-6	2300	46		**45.1 J**	**25.6**	**53.4**	**41.5 J**	**48.4**	**57.4**	**57.4**	**60.6**	**50.2**	**43.4**	**28.4**	**33.9**
TOC (mg/kg)																
TOTAL ORGANIC CARBON					**18000**	**8700 J**	---	---	**8300 J**	**7400 J**	---	**9900 J**	---	---	**22000 J**	**16000 J**

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efro
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-308		SB-309			SB-310		SB-311		SB-312	
				SAMPLE ID	SB-308-CI19-0-1	SB-308-CI19-1-3	SB-309-CI19-0-1	SB-309-CI19-0-1-DUP	SB-309-CI19-1-3	SB-310-CI19-0-1	SB-310-CI19-1-3	SB-311-CI19-0-1	SB-311-CI19-1-3	SB-312-CI19-0-1	SB-312-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER			DUPLICATE	DUPLICATE							
ANALYTE	**CAS**	**HH**	**ECO**												
VOCs (µg/kg)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	2.4 U	**5.3 J**	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHAN	76-13-1	670000		2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,1,2-TRICHLOROETHANE	79-00-5	150	320	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,1-DICHLOROETHANE	75-34-3	3600	140	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,1-DICHLOROETHENE	75-35-4	23000	40	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,1-DICHLOROPROPENE	563-58-6			2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	260 U	260 U	2.5 U	260 U	2.2 U	2.5 U	260 U	270 U	2.1 U	2.3 U	2.4 U	
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,2-DIBROMOETHANE	106-93-4	36	1230	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,2-DICHLOROBENZENE	95-50-1	180000	90	260 U	260 U	2.5 U	260 U	2.2 U	260 U	260 U	270 U	2.1 U	2.3 U	2.4 U	
1,2-DICHLOROETHANE	107-06-2	460	400	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,2-DICHLOROPROPANE	78-87-5	1600	280	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,3-DICHLOROBENZENE	541-73-1		80	2.4 U	2.5 U	2.5 U	260 U	260 U	260 U	260 U	270 U	2.1 U	260 U	260 U	
1,3-DICHLOROPROPANE	142-28-9	160000		2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
1,4-DICHLOROBENZENE	106-46-7	2600	880	260 U	260 U	260 U	2.4 U	260 U	2.5 U	2.4 UJ	2.4 UJ	**0.41 J**	260 U	260 U	
1,4-DIOXANE	123-91-1			---	---	---	---	---	---	---	---	---	---	---	
2,2-DICHLOROPROPANE	594-20-7			2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
2-BUTANONE (MEK)	78-93-3	2700000	1000	12 U	**13 J**	12 U	12 U	11 U	12 U	12 UJ	12 UJ	11 U	12 U	12 U	
2-CHLOROTOLUENE	95-49-8	160000		2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
2-HEXANONE	591-78-6	20000	360	12 U	12 U	12 U	12 U	11 U	12 U	12 UJ	12 UJ	11 U	12 U	12 U	
4-CHLOROTOLUENE	106-43-4	160000		2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
4-ISOPROPYLTOLUENE	99-87-6	190000	10	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	12 U	12 U	12 U	12 U	11 U	12 U	12 UJ	12 UJ	11 U	12 U	12 U	
ACETONE	67-64-1	6100000	40	**32**	**69 J**	12 U	12 U	11 U	**19 J**	**20 J**	**120 J**	11 U	**89**	12 U	
ACRYLONITRILE	107-13-1			---	---	---	---	---	---	---	---	---	---	---	
BENZENE	71-43-2	1200	120	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
BROMOBENZENE	108-86-1	29000		2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
BROMOMETHANE	74-83-9			4.8 U	5.0 U	5.0 U	4.8 U	4.4 U	5.0 U	4.8 UJ	4.9 UJ	4.2 U	4.6 U	4.8 U	
BROMOCHLOROMETHANE	74-97-5	15000		2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
BROMODICHLOROMETHANE	75-27-4	290	540	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
BROMOFORM	75-25-2	19000	70	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
CARBON DISULFIDE	75-15-0	77000	5	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	**0.82 J**	**0.78 J**	2.1 U	2.3 U	2.4 U	
CARBON TETRACHLORIDE	56-23-5	650	50	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
CHLOROBENZENE	108-90-7	28000	2400	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
CHLOROETHANE	75-00-3	1400000		4.8 U	5.0 U	5.0 U	4.8 U	4.4 U	5.0 U	4.8 UJ	4.9 UJ	4.2 U	4.6 U	4.8 U	
CHLOROFORM	67-66-3	320	50	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
CHLOROMETHANE	74-87-3	11000	10400	4.8 U	5.0 U	5.0 U	4.8 U	4.4 U	5.0 U	4.8 UJ	4.9 UJ	4.2 U	4.6 U	4.8 U	
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	2.4 U	**1.7 J**	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
CIS-1,3-DICHLOROPROPENE	10061-01-5		398	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
DIBROMOCHLOROMETHANE	124-48-1	8300		2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
DIBROMOMETHANE	74-95-3	2400	65000	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	4.8 U	5.0 U	5.0 U	4.8 U	4.4 U	5.0 U	4.8 UJ	4.9 UJ	4.2 U	4.6 U	4.8 U	
DIETHYLETHER	60-29-7			---	---	---	---	---	---	---	---	---	---	---	
DIISOPROPYL ETHER	108-20-3			---	---	---	---	---	---	---	---	---	---	---	
ETHYLBENZENE	100-41-4	5800	270	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
HEXACHLOROBUTADIENE	87-68-3	1200	9	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
ISOPROPYLBENZENE	98-82-8	190000	40	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
METHYL BROMIDE	74-83-9			4.8 U	5.0 U	5.0 U	4.8 U	4.4 U	5.0 U	4.8 UJ	4.9 UJ	4.2 U	4.6 U	4.8 U	
METHYL TERT-BUTYL ETHER	1634-04-4	47000		2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
METHYLENE CHLORIDE	75-09-2	35000	210	12 U	12 U	12 U	12 U	11 U	12 U	12 UJ	12 UJ	11 U	12 U	12 U	
NAPHTHALENE	91-20-3	3800	20000	10 U	**14 J**	10 U	10 U	10 U	**41**	**12 J**	**12 J**	11 U	**12 J**	11 U	
N-BUTYL BENZENE	104-51-8	390000		2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
N-PROPYL BENZENE	103-65-1	380000		2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-308		SB-309			SB-310		SB-311		SB-312	
				SAMPLE ID	SB-308-CI19-0-1	SB-308-CI19-1-3	SB-309-CI19-0-1	SB-309-CI19-0-1-DUP	SB-309-CI19-1-3	SB-310-CI19-0-1	SB-310-CI19-1-3	SB-311-CI19-0-1	SB-311-CI19-1-3	SB-312-CI19-0-1	SB-312-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER			DUPLICATE	DUPLICATE							
ANALYTE	**CAS**	**HH**	**ECO**												
VOCs (µg/kg)															
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6			2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
SEC-BUTYL BENZENE	135-98-8	780000		2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
STYRENE	100-42-5	600000	1200	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
TERT-AMYL METHYL ETHER	994-05-8			---	---	---	---	---	---	---	---	---	---	---	
TERT-BUTYL ALCOHOL	75-65-0			---	---	---	---	---	---	---	---	---	---	---	
TERT-BUTYLBENZENE	98-06-6	780000		2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
TERT-BUTYLETHYL ETHER	637-92-3			---	---	---	---	---	---	---	---	---	---	---	
TETRACHLOROETHENE	127-18-4	8100	60	2.4 U	2.5 U	2.5 U	2.4 U	**1.7 J**	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
TETRAHYDROFURAN	109-99-9	1800		12 U	12 U	12 U	12 U	11 U	12 U	12 UJ	12 UJ	11 U	12 U	12 U	
TOLUENE	108-88-3	490000	150	2.4 U	**1.8 J**	**4.1 J**	**2 J**	2.2 U	**1.5 J**	2.4 UJ	**3.8 J**	**1.2 J**	**2.2 J**	2.4 U	
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
TRANS-1,3-DICHLOROPROPENE	10061-02-6		398	2.4 U	2.5 U	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
TRANS-1,4-DICHLORO-2-BUTENE	764-41-0			---	---	---	---	---	---	---	---	---	---	---	
TRICHLOROETHYLENE	79-01-6	410	60	**2.3 J**	**9.1 J**	2.5 U	**0.65 J**	**7.2**	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	4.8 U	5.0 U	5.0 U	4.8 U	4.4 U	5.0 U	4.8 UJ	4.9 UJ	4.2 U	4.6 U	4.8 U	
VINYL CHLORIDE	75-01-4	59	30	4.8 U	5.0 U	5.0 U	4.8 U	4.4 U	5.0 U	4.8 UJ	4.9 UJ	4.2 U	4.6 U	4.8 U	
XYLENE O	95-47-6	65000	100	2.4 U	**1.5 J**	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
XYLENE P,M	179601-23-1		100	4.8 U	5.0 U	5.0 U	4.8 U	4.4 U	5.0 U	4.8 UJ	4.9 UJ	4.2 U	4.6 U	4.8 U	
TOTAL XYLENES	1330-20-7	58000		2.4 U	**1.5 J**	2.5 U	2.4 U	2.2 U	2.5 U	2.4 UJ	2.4 UJ	2.1 U	2.3 U	2.4 U	
SVOC (µg/kg)															
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	260 U	260 U	2.5 U	260 U	2.2 U	2.5 U	260 U	270 U	2.1 U	2.3 U	2.4 U	
1,2-DICHLOROBENZENE	95-50-1	180000	90	260 U	260 U	2.5 U	260 U	2.2 U	260 U	260 U	270 U	2.1 U	2.3 U	2.4 U	
1,3-DICHLOROBENZENE	541-73-1		80	2.4 U	2.5 U	2.5 U	260 U	260 U	260 U	260 U	270 U	2.1 U	260 U	260 U	
1,4-DICHLOROBENZENE	106-46-7	2600	880	260 U	260 U	260 U	2.4 U	260 U	2.5 U	2.4 UJ	2.4 UJ	0.41 J	260 U	260 U	
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000		260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	640 U	650 U	640 U	630 U	650 U	650 U	650 U	---	660 U	660 U	650 U	
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	260 U	260 U	260 U	260 U	260 U	260 U	260 U	---	270 U	260 U	260 U	
2,4-DICHLOROPHENOL	120-83-2	19000	20000	260 U	260 U	260 U	260 U	260 U	260 U	260 U	---	270 U	260 U	260 U	
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	260 U	260 U	260 U	260 U	260 U	260 U	260 U	---	270 U	260 U	260 U	
2,4-DINITROPHENOL	51-28-5	13000	61	640 U	650 U	640 U	630 U	650 U	650 U	650 U	---	660 U	660 U	650 U	
2,4-DINITROTOLUENE	121-14-2	1700	6000	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
2,6-DINITROTOLUENE	606-20-2	360	4000	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
2-CHLORONAPHTHALENE	91-58-7	480000	12.2	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
2-CHLOROPHENOL	95-57-8	39000	60	260 U	260 U	260 U	260 U	260 U	260 U	260 U	---	270 U	260 U	260 U	
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	260 U	260 U	260 U	260 U	260 U	260 U	260 U	---	270 U	260 U	260 U	
2-NITROANILINE	88-74-4	63000	20	640 U	650 U	640 U	630 U	650 U	650 U	650 U	660 U	660 U	660 U	650 U	
2-NITROPHENOL	88-75-5		1600	260 U	260 U	260 U	260 U	260 U	260 U	260 U	---	270 U	260 U	260 U	
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
3-NITROANILINE	99-09-2		3160	640 U	650 U	640 U	630 U	650 U	650 U	650 U	660 U	660 U	660 U	650 U	
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	640 U	650 U	640 U	630 U	650 U	650 U	650 U	---	660 U	660 U	650 U	
4-BROMOPHENYL PHENYL ETHER	101-55-3			260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
4-CHLORO-3-METHYLPHENOL	59-50-7	630000		260 U	260 U	260 U	260 U	260 U	260 U	260 U	---	270 U	260 U	260 U	
4-CHLOROANILINE	106-47-8	2700	1000	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
4-CHLOROPHENYL PHENYL ETHER	7005-72-3			260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
4-NITROANILINE	100-01-6	25000	21900	640 U	650 U	640 U	630 U	650 U	650 U	650 U	660 U	660 U	660 U	650 U	
4-NITROPHENOL	100-02-7		5120	640 U	650 U	640 U	630 U	650 U	650 U	650 U	---	660 U	660 U	650 U	
BENZOIC ACID	65-85-0	25000000	10	640 U	650 U	640 U	630 U	650 U	650 U	650 U	---	660 U	660 U	650 UJ	
BENZYL ALCOHOL	100-51-6	630000	2	510 U	520 U	520 U	510 U	520 U	520 U	520 U	530 U	530 U	530 U	530 U	
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000		260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230		260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
CARBAZOLE	86-74-8		70	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
CRESOLS, M- & P-				260 U	260 U	260 U	260 U	260 U	260 U	260 U	---	270 U	260 U	260 U	
DIBENZOFURAN	132-64-9	7300	150	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
DIETHYL PHTHALATE	84-66-2	5100000	250	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
DIMETHYL PHTHALATE	131-11-3		100000	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U	

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-308		SB-309			SB-310		SB-311		SB-312	
				SAMPLE ID	SB-308-CI19-0-1	SB-308-CI19-1-3	SB-309-CI19-0-1	SB-309-CI19-0-1-DUP	SB-309-CI19-1-3	SB-310-CI19-0-1	SB-310-CI19-1-3	SB-311-CI19-0-1	SB-311-CI19-1-3	SB-312-CI19-0-1	SB-312-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER			DUPLICATE	DUPLICATE							
ANALYTE	**CAS**	**HH**	**ECO**												
SVOC (µg/kg)															
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U
HEXACHLOROBENZENE	118-74-1	210	79	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U
HEXACHLOROETHANE	67-72-1	1800	24	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U
ISOPHORONE	78-59-1	570000	139000	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U
NITROBENZENE	98-95-3	5100	2200	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	260 U	260 U	260 U	260 U	260 U	260 U	260 U	270 U	270 U	260 U	260 U
PENTACHLOROPHENOL	87-86-5	1000	2100	640 U	650 U	640 U	630 U	650 U	650 U	650 U	---	660 U	660 U	650 U
PHENOL	108-95-2	1900000	30000	260 U	260 U	260 U	260 U	260 U	260 U	260 U	---	270 U	260 U	260 U
PAHs (µg/kg)															
1-METHYLNAPHTHALENE	90-12-0	18000	140	**2.2 J**	**18 J**	**3.4 J**	**2.7 J**	**3.3 J**	**41**	**17 J**	**5.3 J**	**4.7 J**	**4.4 J**	11 U
2-METHYLNAPHTHALENE	91-57-6	24000	110	**3.6 J**	**18 J**	**5.0 J**	**3.4 J**	**6.2 J**	**68**	**18 J**	**6.4 J**	**6.7 J**	**6.0 J**	11 U
ACENAPHTHENE	83-32-9	360000	250	10 U	10 U	10 U	10 U	10 U	10 U	11 U	24 U	11 U	**9.8 J**	11 U
ACENAPHTHYLENE	208-96-8	360000	340	10 U	10 U	10 U	10 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U
ANTHRACENE	120-12-7	1800000	1.5	**2.5 J**	**4.2 J**	10 UJ	10 UJ	**15 J**	**1.4 J**	**7.0 J**	**28 J**	**3.6 J**	**11 J**	11 U
BENZO(A)ANTHRACENE	56-55-3	1100	1100	21 U	21 U	21 U	**22**	**72**	21 U	**46**	**400**	**30**	**64**	21 U
BENZO(A)PYRENE	50-32-8	110	1100	**20 J**	**15 J**	**6.4 J**	**24**	**76**	**9.5 J**	**48**	**500**	**30**	**54**	**3.9 J**
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	**35**	**18 J**	**9.4 J**	**37**	**76**	**13 J**	**110**	**800**	**72**	**120**	11 U
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	**22**	10 U	10 U	**14 J**	10 U	10 U	**32**	**360**	**21 J**	**37**	11 U
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	**21**	**14 J**	**10 J**	**21**	**52**	**12 J**	**20 J**	**270**	**13 J**	**33**	11 U
CHRYSENE	218-01-9	110000	1100	**26**	36	**5.5 J**	**26**	**100**	**14 J**	**63**	**470**	**30**	**72**	11 U
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	**4.3 J**	10 U	10 U	**4.6 J**	**10 U**	10 U	**14 J**	**130**	**6.3 J**	**13 J**	11 U
FLUORANTHENE	206-44-0	240000	29000	**33**	21 U	21 U	**25**	**82**	21 U	**69**	**440**	**42**	**120**	11 U
FLUORENE	86-73-7	240000	30000	10 U	**4.6 J**	10 U	10 U	**4.5 J**	**3.9 J**	**6.1 J**	**14 J**	11 U	**8 J**	11 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	21 U	10 U	10 U	21 U	10 U	10 U	21 U	**390**	22 U	**36**	11 U
NAPHTHALENE	91-20-3	2000	160	10 U	**14 J**	10 U	10 U	10 U	**41**	**12 J**	**12 J**	11 U	**12 J**	11 U
PHENANTHRENE	85-01-8	180000	29000	**21**	**23**	**6.9 J**	**8 J**	**66**	**24**	**87**	**200**	**34**	**110**	11 U
PYRENE	129-00-0	180000	1100	**28**	**27**	**8.6 J**	**15 J**	**87**	**11 J**	**83**	**600**	**48**	**140**	11 U
TPH (mg/kg)															
TOTAL PETROLEUM HYDROCARBONS				---	---	---	---	---	---	---	---	---	---	---
VPH (µg/kg)															
C5-C8 ALIPHATICS		52000		---	---	---	---	---	---	---	---	---	---	---
C9-C10 AROMATICS		9700		---	---	---	---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS		9600		---	---	---	---	---	---	---	---	---	---	---
EPH (µg/kg)															
C11-C22 AROMATICS		9700		---	---	---	---	---	---	---	---	---	---	---
C11-C22 UNAJUSTED AROMATICS				---	---	---	---	---	---	---	---	---	---	---
C19-C36 ALIPHATICS		23000000		---	---	---	---	---	---	---	---	---	---	---
C9-C18 ALIPHATICS		9600		---	---	---	---	---	---	---	---	---	---	---
PCBs (µg/kg)															
AROCLOR 1016	12674-11-2	410		---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2	200		---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5	170		---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9	230		---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6	230		---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1	120		---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5	240	20	---	---	---	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	120	20	---	---	---	---	---	---	---	---	---	---	---
METALS (mg/kg)															
ALUMINUM	7429-90-5	7700		**3830**	**3730**	**5830**	**4610**	**6470 J**	**5570**	**4650**	**7930**	**6580**	**7090**	**5250**
ANTIMONY	7440-36-0	3.1	0.27	**1.12**	**0.467**	**0.064**	**0.052 J**	**0.041 J**	**0.110**	**0.085**	**0.133**	**0.164**	**0.098**	**0.049 J**
ARSENIC	7440-38-2	0.68	18	**1.40**	**1.56**	**1.52**	**1.60**	**1.78**	**2.65**	**2.13**	**1.62**	**1.93**	**1.91**	**1.25**
BARIUM	7440-39-3	1500	330	**10.5**	**11.3**	**10.0**	**15.6**	**12.8**	**13.0**	**22.0**	**52.0**	**15.7**	**14.5**	**15.0**
BERYLLIUM	7440-41-7	16	10	**0.376**	**0.377**	**0.461**	**0.414**	**0.476**	**0.671**	**0.554**	**0.508**	**0.473**	**0.502**	**0.431**
CADMIUM	7440-43-9	7.1	0.36	**0.356**	**0.626**	**1.42**	**1.03**	**0.0829**	**0.730**	**0.175**	**1.12**	**0.646**	**0.173**	**0.699**
CALCIUM	7440-70-2			**370**	**332**	**595**	**368**	**497 J**	**546**	**664**	**26600**	**600**	**377**	**304**
CHROMIUM	7440-47-3	12000	0.4	**6.09**	**6.62**	**13.5 J**	**7.2 J**	**9.68 J**	**6.74**	**8.38**	**11.8**	**8.79**	**7.64**	**2.98**

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-308		SB-309			SB-310		SB-311		SB-312	
				SAMPLE ID	SB-308-CI19-0-1	SB-308-CI19-1-3	SB-309-CI19-0-1	SB-309-CI19-0-1-DUP	SB-309-CI19-1-3	SB-310-CI19-0-1	SB-310-CI19-1-3	SB-311-CI19-0-1	SB-311-CI19-1-3	SB-312-CI19-0-1	SB-312-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER			DUPLICATE	DUPLICATE							
ANALYTE	**CAS**	**HH**	**ECO**												
METALS (mg/kg)															
COBALT	7440-48-4	2.3	2.4		**2.16**	**3.55**	**3.35**	**4.56**	**3.40 J**	**3.94**	**3.54**	**2.53**	**1.98**	**2.35**	**0.992**
COPPER	7440-50-8	310	28		**8.98**	**7.90**	**8.15**	**7.33**	**8.94 J**	**8.50**	**7.95**	**9.84**	**10.1**	**9.43**	**3.29**
IRON	7439-89-6	5500			**6060**	**6440**	**8380**	**7180**	**10300**	**9210**	**9200**	**7620**	**7590**	**8410**	**5780**
LEAD	7439-92-1	400	11		**55.3**	**41.5**	**10.0**	**15.6**	**11.6 J**	**12.7**	**18.1**	**43.1**	**167**	**52.7**	**12.0**
MAGNESIUM	7439-95-4				**779**	**1060**	**1450 J**	**844 J**	**1690 J**	**1010**	**967**	**2080**	**1010**	**1120**	**371**
MANGANESE	7439-96-5	180	220		**88.3**	**93.9**	**100**	**93.8**	**115 J**	**92.9**	**115**	**131**	**79.2**	**92.2**	**77.6**
MERCURY	7439-97-6	2.3	0.013		**0.0092 J**	**0.014 J**	**0.033**	**0.017 J**	**0.010 J**	**0.011 J**	**0.013 J**	**0.016 J**	**0.021 J**	**0.022 J**	0.034 U
NICKEL	7440-02-0	150	38		**4.84**	**9.03**	**5.76**	**4.32**	**6.67 J**	**5.40**	**5.88**	**6.23**	**5.35**	**5.51**	**2.37**
POTASSIUM	7440-09-7				**344**	**324**	**380**	**365**	**629 J**	**422**	**330**	**549**	**415**	**429**	**268**
SELENIUM	7782-49-2	39	0.52		**0.10 J**	**0.25**	**0.12 J**	**0.14 J**	**0.12 J**	**0.46**	**0.26 J**	**0.12 J**	**0.15 J**	**0.19 J**	**0.15 J**
SILVER	7440-22-4	39	4.2		**0.043 J**	**0.034**	**0.035 J**	**0.037 J**	**0.022 J**	**0.0698 J**	**0.0578 J**	**0.125**	**0.0824**	**0.0849**	**0.022 J**
SODIUM	7440-23-5				**27.6 J**	**20**	**20 J**	**22.7 J**	**27.9 J**	**27.1 J**	**24.4 J**	**55.4 J**	**31.6 J**	**33.6 J**	**26.1 J**
THALLIUM	7440-28-0	0.078	0.22		**0.057 J**	**0.070**	**0.0687**	**0.065 J**	**0.0926**	**0.0896**	**0.067 J**	**0.0745**	**0.0825**	**0.0918**	**0.058 J**
VANADIUM	7440-62-2	39	2		**5.31**	**5.26**	**7.23**	**6.48**	**10.6**	**7.69**	**7.35**	**10.7**	**12.8**	**11.8**	**5.64**
ZINC	7440-66-6	2300	46		**36.5**	**68.2**	**109**	**78.5**	**27.4 J**	**42.3**	**40.8**	**59.6**	**79.7**	**49.6**	**41.2**
TOC (mg/kg)															
TOTAL ORGANIC CARBON					---	---	**13000 J**	**7300 J**	**22000 J**	---	---	---	---	**17000 J**	**7500 J**

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efro
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-313		SB-314		SB-315		SB-316		SB-317	
				SAMPLE ID	SB-313-CI19-0-1	SB-313-CI19-1-3	SB-314-CI19-0-1	SB-314-CI19-1-3	SB-315-CI19-0-1	SB-315-CI19-1-3	SB-316-CI19-0-1	SB-316-CI19-1-3	SB-317-CI19-0-1	SB-317-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER										
ANALYTE	**CAS**	**HH**	**ECO**											
VOCs (µg/kg)														
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHAN	76-13-1	670000		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,1,2-TRICHLOROETHANE	79-00-5	150	320	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,1-DICHLOROETHANE	75-34-3	3600	140	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,1-DICHLOROETHENE	75-35-4	23000	40	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,1-DICHLOROPROPENE	563-58-6			2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	260 U	2.5 U	260 U	2.4 U	2.2 UJ	250 U	260 U	260 U	2.2 U	250 U	
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 UJ	2.2 U	2.3 U	
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,2-DIBROMOETHANE	106-93-4	36	1230	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,2-DICHLOROBENZENE	95-50-1	180000	90	260 U	2.5 U	260 U	2.4 U	250 U	250 U	260 U	2.5 UJ	2.2 U	250 U	
1,2-DICHLOROETHANE	107-06-2	460	400	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,2-DICHLOROPROPANE	78-87-5	1600	280	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,3-DICHLOROBENZENE	541-73-1		80	260 U	2.5 U	260 U	260 U	250 U	2.3 U	260 U	260 U	260 U	2.3 U	
1,3-DICHLOROPROPANE	142-28-9	160000		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
1,4-DICHLOROBENZENE	106-46-7	2600	880	260 U	250 U	2.4 U	260 U	2.2 UJ	250 U	2.2 U	260 U	2.2 U	250 U	
1,4-DIOXANE	123-91-1			---	---	---	---	---	---	---	---	---	---	
2,2-DICHLOROPROPANE	594-20-7			2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
2-BUTANONE (MEK)	78-93-3	2700000	1000	12 U	12 U	12 U	12 U	11 UJ	12 U	11 U	12 U	11 U	11 U	
2-CHLOROTOLUENE	95-49-8	160000		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 UJ	2.2 U	2.3 U	
2-HEXANONE	591-78-6	20000	360	12 U	12 U	12 U	12 U	11 UJ	12 U	11 U	12 U	11 U	11 U	
4-CHLOROTOLUENE	106-43-4	160000		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
4-ISOPROPYLTOLUENE	99-87-6	190000	10	2.5 U	2.5 U	2.4 U	2.4 U	0.68 **J**	2.3 U	2.2 U	2.5 UJ	1.2 **J**	2.3 U	
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	12 U	12 U	12 U	12 U	11 UJ	12 U	11 U	12 U	11 U	11 U	
ACETONE	67-64-1	6100000	40	**11 J**	**40**	**29**	12 U	11 UJ	12 U	11 U	12 UJ	11 U	11 U	
ACRYLONITRILE	107-13-1			---	---	---	---	---	---	---	---	---	---	
BENZENE	71-43-2	1200	120	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
BROMOBENZENE	108-86-1	29000		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
BROMOMETHANE	74-83-9			5.0 U	5.0 U	4.8 U	4.8 U	4.5 UJ	4.6 U	4.5 U	5.0 U	4.4 U	4.6 U	
BROMOCHLOROMETHANE	74-97-5	15000		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
BROMODICHLOROMETHANE	75-27-4	290	540	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
BROMOFORM	75-25-2	19000	70	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
CARBON DISULFIDE	75-15-0	77000	5	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
CARBON TETRACHLORIDE	56-23-5	650	50	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
CHLOROBENZENE	108-90-7	28000	2400	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
CHLOROETHANE	75-00-3	1400000		5.0 U	5.0 U	4.8 U	4.8 U	4.5 UJ	4.6 U	4.5 U	---	4.4 U	4.6 U	
CHLOROFORM	67-66-3	320	50	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
CHLOROMETHANE	74-87-3	11000	10400	5.0 U	5.0 U	4.8 U	4.8 U	4.5 UJ	4.6 U	4.5 U	5.0 U	4.4 U	4.6 U	
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
CIS-1,3-DICHLOROPROPENE	10061-01-5		398	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
DIBROMOCHLOROMETHANE	124-48-1	8300		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
DIBROMOMETHANE	74-95-3	2400	65000	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	5.0 U	5.0 U	4.8 U	4.8 U	4.5 UJ	4.6 U	4.5 U	5.0 U	4.4 U	4.6 U	
DIETHYLETHER	60-29-7			---	---	---	---	---	---	---	---	---	---	
DIISOPROPYL ETHER	108-20-3			---	---	---	---	---	---	---	---	---	---	
ETHYLBENZENE	100-41-4	5800	270	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
HEXACHLOROBUTADIENE	87-68-3	1200	9	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
ISOPROPYLBENZENE	98-82-8	190000	40	2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
METHYL BROMIDE	74-83-9			5.0 U	5.0 U	4.8 U	4.8 U	4.5 UJ	4.6 U	4.5 U	5.0 U	4.4 U	4.6 U	
METHYL TERT-BUTYL ETHER	1634-04-4	47000		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U	
METHYLENE CHLORIDE	75-09-2	35000	210	12 U	12 U	12 U	12 U	11 UJ	12 U	11 U	12 U	11 U	11 U	
NAPHTHALENE	91-20-3	3800	20000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**6.4 J**	10 U	
N-BUTYL BENZENE	104-51-8	390000		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 UJ	2.2 U	2.3 U	
N-PROPYL BENZENE	103-65-1	380000		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 UJ	2.2 U	2.3 U	

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-313		SB-314		SB-315		SB-316		SB-317	
				SAMPLE ID	SB-313-CI19-0-1	SB-313-CI19-1-3	SB-314-CI19-0-1	SB-314-CI19-1-3	SB-315-CI19-0-1	SB-315-CI19-1-3	SB-316-CI19-0-1	SB-316-CI19-1-3	SB-317-CI19-0-1	SB-317-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER										
ANALYTE	**CAS**	**HH**	**ECO**											
VOCs (µg/kg)														
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6				2.5 U	2.5 U	2.4 U	2.4 U	**0.68 J**	2.3 U	2.2 U	2.5 UJ	**1.2 J**	2.3 U
SEC-BUTYL BENZENE	135-98-8	780000			2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 UJ	2.2 U	2.3 U
STYRENE	100-42-5	600000	1200		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U
TERT-AMYL METHYL ETHER	994-05-8				---	---	---	---	---	---	---	---	---	---
TERT-BUTYL ALCOHOL	75-65-0				---	---	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000			2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 UJ	2.2 U	2.3 U
TERT-BUTYLETHYL ETHER	637-92-3				---	---	---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U
TETRAHYDROFURAN	109-99-9	1800			12 U	12 U	12 U	12 U	11 UJ	12 U	11 U	12 U	11 U	11 U
TOLUENE	108-88-3	490000	150		2.5 U	2.5 U	**1.4 J**	2.4 U	2.2 UJ	2.3 U	**1.9 J**	2.5 U	**1.3 J**	**3.5 J**
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U
TRANS-1,3-DICHLOROPROPENE	10061-02-6		398		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U
TRANS-1,4-DICHLORO-2-BUTENE	764-41-0				---	---	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400		5.0 U	5.0 U	4.8 U	4.8 U	4.5 UJ	4.6 U	4.5 U	5.0 U	4.4 U	4.6 U
VINYL CHLORIDE	75-01-4	59	30		5.0 U	5.0 U	4.8 U	4.8 U	4.5 UJ	4.6 U	4.5 U	5.0 U	4.4 U	4.6 U
XYLENE O	95-47-6	65000	100		2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U
XYLENE P,M	179601-23-1		100		5.0 U	5.0 U	4.8 U	4.8 U	4.5 UJ	4.6 U	4.5 U	5.0 UJ	4.4 U	4.6 U
TOTAL XYLENES	1330-20-7	58000			2.5 U	2.5 U	2.4 U	2.4 U	2.2 UJ	2.3 U	2.2 U	2.5 U	2.2 U	2.3 U
SVOC (µg/kg)														
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270		260 U	2.5 U	260 U	2.4 U	2.2 UJ	250 U	260 U	260 U	2.2 U	250 U
1,2-DICHLOROBENZENE	95-50-1	180000	90		260 U	2.5 U	260 U	2.4 U	250 U	250 U	260 U	2.5 UJ	2.2 U	250 U
1,3-DICHLOROBENZENE	541-73-1		80		260 U	2.5 U	260 U	2.4 U	250 U	2.3 U	260 U	260 U	260 U	2.3 U
1,4-DICHLOROBENZENE	106-46-7	2600	880		260 U	250 U	2.4 U	260 U	2.2 UJ	250 U	2.2 U	260 U	2.2 U	250 U
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000			260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819		630 U	630 U	640 U	640 U	620 U	630 U	640 U	640 U	640 U	620 U
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
2,4-DICHLOROPHENOL	120-83-2	19000	20000		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
2,4-DIMETHYLPHENOL	105-67-9	130000	400000		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
2,4-DINITROPHENOL	51-28-5	13000	61		630 U	630 U	640 U	640 U	620 U	630 U	640 U	640 U	640 U	620 U
2,4-DINITROTOLUENE	121-14-2	1700	6000		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
2,6-DINITROTOLUENE	606-20-2	360	4000		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
2-CHLORONAPHTHALENE	91-58-7	480000	12.2		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
2-CHLOROPHENOL	95-57-8	39000	60		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
2-NITROANILINE	88-74-4	63000	20		630 U	630 U	640 U	640 U	620 U	630 U	640 U	640 U	640 U	620 U
2-NITROPHENOL	88-75-5		1600		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
3-NITROANILINE	99-09-2		3160		630 U	630 U	640 U	640 U	620 U	630 U	640 U	640 U	640 U	620 U
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144		630 U	630 U	640 U	640 U	620 U	630 U	640 U	640 U	640 U	620 U
4-BROMOPHENYL PHENYL ETHER	101-55-3				260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
4-CHLORO-3-METHYLPHENOL	59-50-7	630000			260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
4-CHLOROANILINE	106-47-8	2700	1000		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
4-CHLOROPHENYL PHENYL ETHER	7005-72-3				260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
4-NITROANILINE	100-01-6	25000	21900		630 U	630 U	640 U	640 U	620 U	630 U	640 U	640 U	640 U	620 U
4-NITROPHENOL	100-02-7		5120		630 U	630 U	640 U	640 U	620 U	630 U	640 U	640 U	640 U	620 U
BENZOIC ACID	65-85-0	25000000	10		630 UJ	630 UJ	640 UJ	640 UJ	620 UJ	630 UJ	640 UJ	640 UJ	640 UJ	620 UJ
BENZYL ALCOHOL	100-51-6	630000	2		510 U	500 U	510 U	510 U	500 U	510 U	520 U	510 U	510 U	500 U
BENZYL BUTYL PHTHALATE	85-68-7	290000	590		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000			260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230			260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20		260 U	250 U	260 U	260 U	**150 J**	250 U	260 U	260 U	260 U	250 U
CARBAZOLE	86-74-8		70		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
CRESOLS, M- & P-					260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
DIBENZOFURAN	132-64-9	7300	150		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
DIETHYL PHTHALATE	84-66-2	5100000	250		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
DIMETHYL PHTHALATE	131-11-3		100000		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
DI-N-BUTYL PHTHALATE	84-74-2	630000	11		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-313		SB-314		SB-315		SB-316		SB-317	
				SAMPLE ID	SB-313-CI19-0-1	SB-313-CI19-1-3	SB-314-CI19-0-1	SB-314-CI19-1-3	SB-315-CI19-0-1	SB-315-CI19-1-3	SB-316-CI19-0-1	SB-316-CI19-1-3	SB-317-CI19-0-1	SB-317-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER										
ANALYTE	**CAS**	**HH**	**ECO**											
SVOC (µg/kg)														
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
HEXACHLOROBENZENE	118-74-1	210	79		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
HEXACHLOROETHANE	67-72-1	1800	24		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
ISOPHORONE	78-59-1	570000	139000		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
NITROBENZENE	98-95-3	5100	2200		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
N-NITROSODIPHENYLAMINE	86-30-6	110000	545		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
PENTACHLOROPHENOL	87-86-5	1000	2100		630 U	630 U	640 U	640 U	620 U	630 U	640 U	640 U	640 U	620 U
PHENOL	108-95-2	1900000	30000		260 U	250 U	260 U	260 U	250 U	250 U	260 U	260 U	260 U	250 U
PAHs (µg/kg)														
1-METHYLNAPHTHALENE	90-12-0	18000	140		10 U	10 U	10 U	10 U	**3.8 J**	10 U	10 U	10 U	10 U	10 U
2-METHYLNAPHTHALENE	91-57-6	24000	110		10 U	10 U	10 U	10 U	**7.4 J**	10 U	10 U	10 U	**5.6 J**	10 U
ACENAPHTHENE	83-32-9	360000	250		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ACENAPHTHYLENE	208-96-8	360000	340		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ANTHRACENE	120-12-7	1800000	1.5		**8.2 J**	10 U	**4.4 J**	**1.6 J**	**5.0 J**	10 U	10 U	10 U	**9.4 J**	10 U
BENZO(A)ANTHRACENE	56-55-3	1100	1100		**69**	20 U	**38**	21 U	**41**	10 U	21 U	10 U	**61**	10 U
BENZO(A)PYRENE	50-32-8	110	1100		**79**	10 U	**49**	**9.6 J**	**44**	10 U	10 U	10 U	**48**	10 U
BENZO(B)FLUORANTHENE	205-99-2	1100	1100		**120**	**3.4 J**	**77**	**16 J**	**78**	10 U	**5.5 J**	10 U	**100**	10 U
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100		**58**	10 U	**27**	**3.3 J**	**36**	10 U	10 U	10 U	**31**	10 U
BENZO(K)FLUORANTHENE	207-08-9	11000	1100		**52**	10 U	**35**	**8 J**	**32**	10 U	10 U	10 U	**46**	10 U
CHRYSENE	218-01-9	110000	1100		**86**	**3.0 J**	**50**	**13 J**	**55**	10 U	**3.1 J**	10 U	**60**	10 U
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60		**18 J**	10 U	**9.6 J**	**2.2 J**	**11 J**	10 U	10 U	10 U	**12 J**	10 U
FLUORANTHENE	206-44-0	240000	29000		**130**	**3.0 J**	**82**	**26**	**78**	10 U	**3.1 J**	10 U	**130**	10 U
FLUORENE	86-73-7	240000	30000		10 U	10 U	10 U	10 U	**16 J**	10 U	10 U	10 U	**5.8 J**	10 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100		**39**	**5.1 J**	**27**	**9.4 J**	**28**	10 U	**6.1 J**	21 U	**40**	10 U
NAPHTHALENE	91-20-3	2000	160		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**6.4 J**	10 U
PHENANTHRENE	85-01-8	180000	29000		**60**	**2.1 J**	**36**	**13 J**	**55**	10 U	**2.2 J**	10 U	**88**	10 U
PYRENE	129-00-0	180000	1100		**110**	**2.8 J**	**68**	**17 J**	**86**	10 U	**2.6 J**	10 U	**110**	10 U
TPH (mg/kg)														
TOTAL PETROLEUM HYDROCARBONS					---	---	---	---	---	---	---	---	---	---
VPH (µg/kg)														
C5-C8 ALIPHATICS		52000			---	---	---	---	---	---	---	---	---	---
C9-C10 AROMATICS		9700			---	---	---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS		9600			---	---	---	---	---	---	---	---	---	---
EPH (µg/kg)														
C11-C22 AROMATICS		9700			---	---	---	---	---	---	---	---	---	---
C11-C22 UNAJUSTED AROMATICS					---	---	---	---	---	---	---	---	---	---
C19-C36 ALIPHATICS		23000000			---	---	---	---	---	---	---	---	---	---
C9-C18 ALIPHATICS		9600			---	---	---	---	---	---	---	---	---	---
PCBs (µg/kg)														
AROCLOR 1016	12674-11-2	410			---	---	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2	200			---	---	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5	170			---	---	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9	230			---	---	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6	230			---	---	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1	120			---	---	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5	240	20		---	---	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	120	20		---	---	---	---	---	---	---	---	---	---
METALS (mg/kg)														
ALUMINUM	7429-90-5	7700			**2810**	**8870**	**5600**	**4450**	**7460**	**6100**	**9960**	**6020**	**8160**	**3900**
ANTIMONY	7440-36-0	3.1	0.27		**0.070**	**0.100**	**0.072 J**	**0.056 J**	**0.097**	**0.026 J**	**0.060 J**	**0.035 J**	**0.120**	**0.017 J**
ARSENIC	7440-38-2	0.68	18		**1.35**	**2.60**	**2.18**	**1.66**	**2.56**	**1.44**	**1.75**	**1.17**	**2.56**	**0.902**
BARIUM	7440-39-3	1500	330		**11.1**	**10.5**	**6.09**	**10.6**	**17.5**	**13.1**	**12.7**	**7.69**	**14.0**	**8.01**
BERYLLIUM	7440-41-7	16	10		**0.322**	**0.489**	**0.527**	**0.339**	**0.453**	**0.561**	**0.563**	**0.439**	**0.469**	**0.791**
CADMIUM	7440-43-9	7.1	0.36		**0.263**	**0.057 J**	**0.292**	**0.226**	**0.181**	**0.0992**	**0.016 J**	**0.020 J**	**0.161**	**0.120**
CALCIUM	7440-70-2				**484**	**592**	**444**	**430**	**370**	**267**	**287**	**215 J**	**420**	**251**
CHROMIUM	7440-47-3	12000	0.4		**3.53**	**7.80**	**9.20**	**3.80**	**13.1**	**4.74**	**7.52**	**4.61**	**9.04**	**2.42**

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-313		SB-314		SB-315		SB-316		SB-317	
				SAMPLE ID	SB-313-CI19-0-1	SB-313-CI19-1-3	SB-314-CI19-0-1	SB-314-CI19-1-3	SB-315-CI19-0-1	SB-315-CI19-1-3	SB-316-CI19-0-1	SB-316-CI19-1-3	SB-317-CI19-0-1	SB-317-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER										
ANALYTE	**CAS**	**HH**	**ECO**											
METALS (mg/kg)														
COBALT	7440-48-4	2.3	2.4		**1.30**	**2.91**	**3.23**	**1.42**	**3.19**	**2.85**	**2.54**	**2.24**	**3.43**	**2.01**
COPPER	7440-50-8	310	28		**5.50**	**5.83**	**10.4**	**13.2**	**9.82**	**5.07**	**9.42**	**5.34**	**8.49**	**4.12**
IRON	7439-89-6	5500			**4240**	**8980**	**8270**	**5760**	**10700**	**9040**	**14600**	**7010**	**11000**	**6520**
LEAD	7439-92-1	400	11		**219**	**16.0**	**55.1**	**939**	**67.9**	**5.72**	**7.10**	**4.77**	**30.8**	**4.94**
MAGNESIUM	7439-95-4				**526**	**1450**	**1100**	**517**	**1220**	**830**	**1690**	**953 J**	**1480**	**784**
MANGANESE	7439-96-5	180	220		**54.6**	**93.6**	**112**	**64.2**	**117**	**252**	**77.4**	**56.5 J**	**149**	**173**
MERCURY	7439-97-6	2.3	0.013		0.028 U	0.032 U	**0.045**	0.033 U	0.029 U	0.030 U	0.032 U	0.029 U	0.032 U	0.014 U
NICKEL	7440-02-0	150	38		**2.65**	**5.27**	**6.07**	**2.80**	**8.29**	**4.45**	**6.07**	**4.29 J**	**7.28**	**3.63**
POTASSIUM	7440-09-7				**229**	**457**	**450**	**234**	**404**	**505**	**336**	**320**	**522**	**409**
SELENIUM	7782-49-2	39	0.52		**0.099 J**	**0.28 J**	**0.14 J**	**0.11 J**	**0.254 J**	**0.16 J**	**0.408**	**0.086 J**	**0.22 J**	**0.058 J**
SILVER	7440-22-4	39	4.2		**0.0489 J**	**0.031 J**	**0.043 J**	**0.037 J**	**0.109**	**0.033 J**	**0.032 J**	**0.017 J**	**0.0874**	**0.014 J**
SODIUM	7440-23-5				**26.2 J**	**41.7 J**	**34.4 J**	**24.5 J**	**38.6 J**	**30.6 J**	**25.3 J**	**19.9 J**	**60.8 J**	**31.9 J**
THALLIUM	7440-28-0	0.078	0.22		**0.033 J**	**0.079 J**	**0.0735 J**	**0.046 J**	**0.100**	**0.110**	**0.0918**	**0.0625**	**0.111**	**0.0835**
VANADIUM	7440-62-2	39	2		**6.27**	**11.4**	**9.84**	**6.57**	**13.4**	**7.66**	**11.5**	**6.08**	**13.6**	**3.29**
ZINC	7440-66-6	2300	46		**75.6**	**75.8**	**54.0**	**38.1**	**35.3**	**33.4**	**33.5**	**21.2**	**32.7**	**39.4**
TOC (mg/kg)														
TOTAL ORGANIC CARBON					---	---	**9500 J**	**7400 J**	---	---	**6500 J**	**5500 J**	**20000 J**	**2900 J**

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efro
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-318		SB-319		SB-320		SB-321		SB-322	
				SAMPLE ID	SB-318-CI19-0-1	SB-318-CI19-1-3	SB-319-CI19-0-1	SB-319-CI19-1-3	SB-320-CI19-0-1	SB-320-CI19-1-3	SB-321-CI19-0-1	SB-321-CI19-1-3	SB-322-CI19-0-1	SB-322-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER										
ANALYTE	**CAS**	**HH**	**ECO**											
VOCs (µg/kg)														
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHAN	76-13-1	670000		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,1,2-TRICHLOROETHANE	79-00-5	150	320	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,1-DICHLOROETHANE	75-34-3	3600	140	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,1-DICHLOROETHENE	75-35-4	23000	40	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,1-DICHLOROPROPENE	563-58-6			2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	2.4 U	260 U	240 U	2.5 U	250 U	250 U	220 U	260 U	240 U	2.5 U
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,2-DIBROMOETHANE	106-93-4	36	1230	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,2-DICHLOROBENZENE	95-50-1	180000	90	260 U	2.5 U	240 U	2.5 U	2.4 UJ	2.3 U	220 U	2.2 U	240 U	2.5 U
1,2-DICHLOROETHANE	107-06-2	460	400	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,2-DICHLOROPROPANE	78-87-5	1600	280	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,3-DICHLOROBENZENE	541-73-1		80	260 U	2.5 U	2.0 U	230 U	2.4 UJ	2.3 U	220 U	2.2 U	240 U	240 U
1,3-DICHLOROPROPANE	142-28-9	160000		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
1,4-DICHLOROBENZENE	106-46-7	2600	880	2.4 U	2.5 U	2.0 U	230 U	250 U	250 U	2.2 U	2.2 U	2.3 U	2.5 U
1,4-DIOXANE	123-91-1			---	---	---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7			2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
2-BUTANONE (MEK)	78-93-3	2700000	1000	12 U	12 U	9.9 U	12 U	12 UJ	12 U	11 U	11 U	11 U	12 U
2-CHLOROTOLUENE	95-49-8	160000		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
2-HEXANONE	591-78-6	20000	360	12 U	12 U	9.9 U	12 U	12 UJ	12 U	11 U	11 U	11 U	12 U
4-CHLOROTOLUENE	106-43-4	160000		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
4-ISOPROPYLTOLUENE	99-87-6	190000	10	2.4 U	2.5 U	**0.91 J**	2.5 U	**7.2 J**	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	12 U	12 U	9.9 U	12 U	12 UJ	12 U	11 U	11 U	11 U	12 U
ACETONE	67-64-1	6100000	40	**91**	12 U	9.9 U	12 U	**42 J**	12 U	**14 J**	11 U	**52**	12 U
ACRYLONITRILE	107-13-1			---	---	---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	120	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
BROMOBENZENE	108-86-1	29000		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
BROMOMETHANE	74-83-9			4.8 U	5 U	4.0 U	5.0 U	4.8 UJ	4.6 U	4.5 U	4.4 U	4.6 U	5 U
BROMOCHLOROMETHANE	74-97-5	15000		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
BROMODICHLOROMETHANE	75-27-4	290	540	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
BROMOFORM	75-25-2	19000	70	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
CARBON DISULFIDE	75-15-0	77000	5	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
CARBON TETRACHLORIDE	56-23-5	650	50	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
CHLOROBENZENE	108-90-7	28000	2400	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
CHLOROETHANE	75-00-3	1400000		4.8 U	5.0 U	4.0 U	5.0 U	4.8 UJ	4.6 U	4.5 U	4.4 U	4.6 U	5 U
CHLOROFORM	67-66-3	320	50	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
CHLOROMETHANE	74-87-3	11000	10400	4.8 U	5.0 U	4.0 U	5.0 U	4.8 UJ	4.6 U	4.5 U	4.4 U	4.6 U	5 U
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
CIS-1,3-DICHLOROPROPENE	10061-01-5		398	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
DIBROMOCHLOROMETHANE	124-48-1	8300		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
DIBROMOMETHANE	74-95-3	2400	65000	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	4.8 U	5 U	4.0 U	5.0 U	4.8 UJ	4.6 U	4.5 U	4.4 U	4.6 U	5 U
DIETHYLETHER	60-29-7			---	---	---	---	---	---	---	---	---	---
DIISOPROPYL ETHER	108-20-3			---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
HEXACHLOROBUTADIENE	87-68-3	1200	9	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
ISOPROPYLBENZENE	98-82-8	190000	40	2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
METHYL BROMIDE	74-83-9			4.8 U	5.0 U	4.0 U	5.0 U	4.8 UJ	4.6 U	4.5 U	4.4 U	4.6 U	5 U
METHYL TERT-BUTYL ETHER	1634-04-4	47000		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
METHYLENE CHLORIDE	75-09-2	35000	210	12 U	12 U	9.9 U	12 U	12 UJ	12 U	11 U	11 U	11 U	12 U
NAPHTHALENE	91-20-3	3800	20000	10 U	10 U	**2.8 J**	**15 J**	10 U	10 U	8.7 U	10 U	**33**	9.7 U
N-BUTYL BENZENE	104-51-8	390000		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
N-PROPYL BENZENE	103-65-1	380000		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-318		SB-319		SB-320		SB-321		SB-322	
				SAMPLE ID	SB-318-CI19-0-1	SB-318-CI19-1-3	SB-319-CI19-0-1	SB-319-CI19-1-3	SB-320-CI19-0-1	SB-320-CI19-1-3	SB-321-CI19-0-1	SB-321-CI19-1-3	SB-322-CI19-0-1	SB-322-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER										
ANALYTE	**CAS**	**HH**	**ECO**											
VOCs (µg/kg)														
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6				2.4 U	2.5 U	**0.91 J**	2.5 U	**7.2 J**	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
SEC-BUTYL BENZENE	135-98-8	780000			2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
STYRENE	100-42-5	600000	1200		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
TERT-AMYL METHYL ETHER	994-05-8				---	---	---	---	---	---	---	---	---	---
TERT-BUTYL ALCOHOL	75-65-0				---	---	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000			2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
TERT-BUTYLETHYL ETHER	637-92-3				---	---	---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60		2.4 U	2.5 U	2.0 U	**1.4 J**	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
TETRAHYDROFURAN	109-99-9	1800			12 U	12 U	9.9 U	12 U	12 UJ	12 U	11 U	11 U	11 U	12 U
TOLUENE	108-88-3	490000	150		**3.8 J**	**3.9 J**	2.0 U	2.5 U	2.4 UJ	**3.1 J**	**1.9 J**	2.2 U	**1.7 J**	2.5 U
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
TRANS-1,3-DICHLOROPROPENE	10061-02-6		398		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
TRANS-1,4-DICHLORO-2-BUTENE	764-41-0				---	---	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60		2.4 U	2.5 U	2.9 **J**	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400		4.8 U	5.0 U	4.0 U	5.0 U	4.8 UJ	4.6 U	4.5 U	4.4 U	4.6 U	5 U
VINYL CHLORIDE	75-01-4	59	30		4.8 U	5.0 U	4.0 U	5.0 U	4.8 UJ	4.6 U	4.5 U	4.4 U	4.6 U	5 U
XYLENE O	95-47-6	65000	100		2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
XYLENE P,M	179601-23-1		100		4.8 U	5.0 U	4.0 U	5.0 U	4.8 UJ	4.6 U	4.5 U	4.4 U	4.6 U	5 U
TOTAL XYLENES	1330-20-7	58000			2.4 U	2.5 U	2.0 U	2.5 U	2.4 UJ	2.3 U	2.2 U	2.2 U	2.3 U	2.5 U
SVOC (µg/kg)														
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270		2.4 U	260 U	240 U	2.5 U	250 U	250 U	220 U	260 U	240 U	2.5 U
1,2-DICHLOROBENZENE	95-50-1	180000	90		260 U	2.5 U	240 U	2.5 U	2.4 UJ	2.3 U	220 U	2.2 U	240 U	2.5 U
1,3-DICHLOROBENZENE	541-73-1		80		260 U	2.5 U	2.0 U	230 U	2.4 UJ	2.3 U	220 U	2.2 U	240 U	240 U
1,4-DICHLOROBENZENE	106-46-7	2600	880		2.4 U	2.5 U	2.0 U	230 U	250 U	250 U	2.2 U	2.2 U	2.3 U	2.5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000			260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819		640 U	650 U	580 U	580 U	620 U	610 U	530 U	630 U	590 U	600 U
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
2,4-DICHLOROPHENOL	120-83-2	19000	20000		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
2,4-DIMETHYLPHENOL	105-67-9	130000	400000		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
2,4-DINITROPHENOL	51-28-5	13000	61		640 U	650 U	580 U	580 U	620 U	610 U	530 U	630 U	590 U	600 U
2,4-DINITROTOLUENE	121-14-2	1700	6000		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
2,6-DINITROTOLUENE	606-20-2	360	4000		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
2-CHLORONAPHTHALENE	91-58-7	480000	12.2		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
2-CHLOROPHENOL	95-57-8	39000	60		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
2-NITROANILINE	88-74-4	63000	20		640 U	650 U	580 U	580 U	620 U	610 U	530 U	630 U	590 U	600 U
2-NITROPHENOL	88-75-5		1600		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
3-NITROANILINE	99-09-2		3160		640 U	650 U	580 U	580 U	620 U	610 U	530 U	630 U	590 U	600 U
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144		640 U	650 U	580 U	580 U	620 U	610 U	530 U	630 U	590 U	600 U
4-BROMOPHENYL PHENYL ETHER	101-55-3				260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
4-CHLORO-3-METHYLPHENOL	59-50-7	630000			260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
4-CHLOROANILINE	106-47-8	2700	1000		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
4-CHLOROPHENYL PHENYL ETHER	7005-72-3				260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
4-NITROANILINE	100-01-6	25000	21900		640 U	650 U	580 U	580 U	620 U	610 U	530 U	630 U	590 U	600 U
4-NITROPHENOL	100-02-7		5120		640 U	650 U	580 U	580 U	620 U	610 U	530 U	630 U	590 U	600 U
BENZOIC ACID	65-85-0	25000000	10		640 UJ	650 UJ	580 UJ	580 UJ	620 UJ	610 UJ	530 UJ	630 UJ	590 UJ	600 UJ
BENZYL ALCOHOL	100-51-6	630000	2		520 U	520 U	470 U	470 U	500 U	490 U	430 U	510 U	470 U	480 U
BENZYL BUTYL PHTHALATE	85-68-7	290000	590		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000			260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230			260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20		260 U	260 U	240 U	**430**	250 U	250 U	220 U	260 U	240 U	240 U
CARBAZOLE	86-74-8		70		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
CRESOLS, M- & P-					260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
DIBENZOFURAN	132-64-9	7300	150		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
DIETHYL PHTHALATE	84-66-2	5100000	250		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
DIMETHYL PHTHALATE	131-11-3		100000		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
DI-N-BUTYL PHTHALATE	84-74-2	630000	11		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-318		SB-319		SB-320		SB-321		SB-322	
				SAMPLE ID	SB-318-CI19-0-1	SB-318-CI19-1-3	SB-319-CI19-0-1	SB-319-CI19-1-3	SB-320-CI19-0-1	SB-320-CI19-1-3	SB-321-CI19-0-1	SB-321-CI19-1-3	SB-322-CI19-0-1	SB-322-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER										
ANALYTE	**CAS**	**HH**	**ECO**											
SVOC (µg/kg)														
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
HEXACHLOROBENZENE	118-74-1	210	79		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
HEXACHLOROETHANE	67-72-1	1800	24		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
ISOPHORONE	78-59-1	570000	139000		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
NITROBENZENE	98-95-3	5100	2200		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
N-NITROSODIPHENYLAMINE	86-30-6	110000	545		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
PENTACHLOROPHENOL	87-86-5	1000	2100		640 U	650 U	580 U	580 U	620 U	610 U	530 U	630 U	590 U	600 U
PHENOL	108-95-2	1900000	30000		260 U	260 U	240 U	230 U	250 U	250 U	220 U	260 U	240 U	240 U
PAHs (µg/kg)														
1-METHYLNAPHTHALENE	90-12-0	18000	140		10 U	10 U	9.5 U	**4.1 J**	10 U	10 U	8.7 U	10 U	**24**	**1.7 J**
2-METHYLNAPHTHALENE	91-57-6	24000	110		10 U	10 U	**3.1 J**	**18 J**	**5.4 J**	10 U	**5.0 J**	**4.4 J**	**71**	**12 J**
ACENAPHTHENE	83-32-9	360000	250		10 U	10 U	9.5 U	**9.0 J**	**8.3 J**	10 U	8.7 U	**11 J**	**5.0 J**	9.7 U
ACENAPHTHYLENE	208-96-8	360000	340		10 U	10 U	9.5 U	9.5 U	10 U	10 U	8.7 U	10 U	9.5 U	9.7 U
ANTHRACENE	120-12-7	1800000	1.5		10 U	10 U	**2.4 J**	**13 J**	**17 J**	10 U	**8.6 J**	**25**	**3.8 J**	9.7 U
BENZO(A)ANTHRACENE	56-55-3	1100	1100		**3.2 J**	10 U	**24**	**100**	**62**	10 U	**59**	**89**	**12 J**	**14 J**
BENZO(A)PYRENE	50-32-8	110	1100		**3.8 J**	10 U	**28**	**100**	**54**	10 U	**76**	**92**	**12 J**	**17 J**
BENZO(B)FLUORANTHENE	205-99-2	1100	1100		**7.1 J**	10 U	**46**	**170**	**79**	**2.6 J**	**110**	**120**	**28**	**31**
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100		**5.6 J**	10 U	**21**	**70**	**30**	10 U	**76**	**50**	**16 J**	**12 J**
BENZO(K)FLUORANTHENE	207-08-9	11000	1100		**4.4 J**	10 U	**16 J**	**58**	**30**	10 U	**34**	**60**	**7.5 J**	**11 J**
CHRYSENE	218-01-9	110000	1100		**4.5 J**	10 U	**27**	**110**	**62**	**1.9 J**	**74**	93	**36**	**26**
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60		**2.7 J**	10 U	**5.2 J**	**21**	**11 J**	10 U	**16 J**	**16 J**	**4.0 J**	**3.7 J**
FLUORANTHENE	206-44-0	240000	29000		**5.7 J**	10 U	**39**	**200**	**120**	**2.2 J**	**79**	**200**	**21**	**24**
FLUORENE	86-73-7	240000	30000		10 U	10 U	9.5 U	**8.1 J**	**9.3 J**	10 U	8.7 U	**9.7 J**	**3.4 J**	9.7 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100		21 U	10 U	**24**	**89**	**39**	10 U	**67**	**64**	**18 J**	**16 J**
NAPHTHALENE	91-20-3	2000	160		10 U	10 U	**2.8 J**	**15 J**	10 U	10 U	8.7 U	10 U	**33**	9.7 U
PHENANTHRENE	85-01-8	180000	29000		**2.5 J**	10 U	**15 J**	**120**	**97**	10 U	**35**	**130**	**37**	**18 J**
PYRENE	129-00-0	180000	1100		**7.8 J**	10 U	**43**	**200**	**120**	**2.4 J**	**93**	**170**	**22**	**22**
TPH (mg/kg)														
TOTAL PETROLEUM HYDROCARBONS					---	---	---	---	---	---	---	---	---	---
VPH (µg/kg)														
C5-C8 ALIPHATICS		52000			---	---	---	---	---	---	---	---	---	---
C9-C10 AROMATICS		9700			---	---	---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS		9600			---	---	---	---	---	---	---	---	---	---
EPH (µg/kg)														
C11-C22 AROMATICS		9700			---	---	---	---	---	---	---	---	---	---
C11-C22 UNAJUSTED AROMATICS					---	---	---	---	---	---	---	---	---	---
C19-C36 ALIPHATICS		23000000			---	---	---	---	---	---	---	---	---	---
C9-C18 ALIPHATICS		9600			---	---	---	---	---	---	---	---	---	---
PCBs (µg/kg)														
AROCLOR 1016	12674-11-2	410			---	---	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2	200			---	---	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5	170			---	---	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9	230			---	---	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6	230			---	---	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1	120			---	---	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5	240	20		---	---	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	120	20		---	---	---	---	---	---	---	---	---	---
METALS (mg/kg)														
ALUMINUM	7429-90-5	7700			**7680**	**2500**	**11900**	**5240**	**6780**	**7150**	**4680**	**4170**	**4140**	**7640**
ANTIMONY	7440-36-0	3.1	0.27		**0.052 J**	0.038 U	**0.079**	**0.110**	**0.172**	**0.043 J**	**0.447**	**0.170**	**0.197**	**1.12**
ARSENIC	7440-38-2	0.68	18		**1.34**	**0.850**	**2.47**	**2.45**	**3.40**	**1.44**	**1.71**	**1.44**	**1.91**	**8.02**
BARIUM	7440-39-3	1500	330		**14.0**	**5.08**	**17.9**	**14.2**	**20.7**	**10.7**	**23.9**	**10.5**	**16.2**	**34.8**
BERYLLIUM	7440-41-7	16	10		**0.483**	**0.274**	**0.536**	**0.508**	**0.535**	**0.384**	**4.42**	**0.410**	**0.346**	**0.504**
CADMIUM	7440-43-9	7.1	0.36		**0.0885**	**0.028 J**	**0.171**	**0.167**	**0.565**	**0.230**	**0.292**	**2.46**	**1.13**	**4.22**
CALCIUM	7440-70-2				**216**	**278**	**1030**	**662**	**671**	**370**	**742**	**499**	**360**	**798**
CHROMIUM	7440-47-3	12000	0.4		**5.69**	**1.94**	**8.43**	**12.0**	**7.63**	**5.28**	**32.2**	**6.71**	**7.64**	**29.1**

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-318		SB-319		SB-320		SB-321		SB-322	
				SAMPLE ID	SB-318-CI19-0-1	SB-318-CI19-1-3	SB-319-CI19-0-1	SB-319-CI19-1-3	SB-320-CI19-0-1	SB-320-CI19-1-3	SB-321-CI19-0-1	SB-321-CI19-1-3	SB-322-CI19-0-1	SB-322-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER										
ANALYTE	**CAS**	**HH**	**ECO**											
METALS (mg/kg)														
COBALT	7440-48-4	2.3	2.4		**1.64**	**1.82**	**1.71**	**3.54**	**3.16**	**1.53**	**7.57**	**1.98**	**1.40**	**2.41**
COPPER	7440-50-8	310	28		**5.09**	**2.66**	**5.09**	**16.9**	**8.96**	**4.57**	**116**	**6.52**	**8.72**	**17.3**
IRON	7439-89-6	5500			**7850**	**4310**	**9740**	**10200**	**8720**	**6990**	**14300**	**6200**	**6420**	**8810**
LEAD	7439-92-1	400	11		**13.0**	**2.40**	**18.5**	**54.6**	**41.1**	**5.18**	**159**	**31.8**	**128**	**140**
MAGNESIUM	7439-95-4				**801**	**389**	**1020**	**1210**	**1340**	**762**	**827**	**729**	**675**	**1010**
MANGANESE	7439-96-5	180	220		**82.1**	**50.0**	**82.1**	**124**	**117**	**51.4**	**148**	**84.3**	**59.8**	**107**
MERCURY	7439-97-6	2.3	0.013		0.030 U	0.017 U	**0.036**	0.036 U	0.033 U	0.034 U	**0.0574**	**0.0513**	**0.190**	**0.031 J**
NICKEL	7440-02-0	150	38		**4.18**	**2.38**	**4.34**	**9.73**	**5.73**	**3.97**	**67.7**	**3.7**	**3.26**	**5.33**
POTASSIUM	7440-09-7				**248**	**236**	**662**	**514**	**574**	**234**	**404**	**355**	**378**	**421**
SELENIUM	7782-49-2	39	0.52		**0.23 J**	**0.042 J**	**0.396**	**0.16 J**	**0.18 J**	**0.17 J**	**0.28 J**	**0.081 J**	**0.11 J**	**0.25 J**
SILVER	7440-22-4	39	4.2		**0.043 J**	**0.0064 J**	**0.073**	**0.442**	**0.0581 J**	**0.024 J**	**0.145**	**0.0562**	**0.242**	**4.94**
SODIUM	7440-23-5				**25 J**	**18 J**	**80.2**	**44.9 J**	**31.8 J**	**22.8 J**	**83.4**	**26.7 J**	**40.5 J**	**65.4 J**
THALLIUM	7440-28-0	0.078	0.22		**0.076 J**	**0.034 J**	**0.125**	**0.0708**	**0.102**	**0.0641**	**0.051 J**	**0.0533 J**	**0.054 J**	**0.0886**
VANADIUM	7440-62-2	39	2		**8.70**	**3.53**	**15.5**	**11.1**	**9.86**	**8.58**	**7.28**	**5.97**	**7.27**	**10.1**
ZINC	7440-66-6	2300	46		**29.4**	**14.9**	**30.2**	**43.4**	**40.8**	**16.8**	**425**	**33.5**	**36.1**	**72.0**
TOC (mg/kg)														
TOTAL ORGANIC CARBON					---	---	**20000 J**	**11000 J**	---	---	---	---	**28000 J**	**12000 J**

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efro
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-323		SB-324		SB-325		SB-326	
				SAMPLE ID	SB-323-CI19-0-1	SB-323-CI19-1-3	SB-324-CI19-0-1	SB-324-CI19-1-3	SB-325-CI19-0-1	SB-325-CI19-1-3	SB-326-CI19-0-1	SB-326-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER								
ANALYTE	**CAS**	**HH**	**ECO**									
VOCs (µg/kg)												
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHAN	76-13-1	670000		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,1,2-TRICHLOROETHANE	79-00-5	150	320	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,1-DICHLOROETHANE	75-34-3	3600	140	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,1-DICHLOROETHENE	75-35-4	23000	40	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,1-DICHLOROPROPENE	563-58-6			2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	260 U	2.2 U	2.5 UJ	1.2 U	260 U	3.2 U	210 U	220 U
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,2-DIBROMOETHANE	106-93-4	36	1230	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,2-DICHLOROBENZENE	95-50-1	180000	90	2.2 U	2.2 U	2.5 UJ	1.2 U	260 U	280 U	210 U	220 U
1,2-DICHLOROETHANE	107-06-2	460	400	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,2-DICHLOROPROPANE	78-87-5	1600	280	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,3-DICHLOROBENZENE	541-73-1		80	2.2 U	240 U	260 U	1.2 U	260 U	280 U	210 U	2.8 U
1,3-DICHLOROPROPANE	142-28-9	160000		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
1,4-DICHLOROBENZENE	106-46-7	2600	880	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	280 U	210 U	220 U
1,4-DIOXANE	123-91-1			---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7			2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
2-BUTANONE (MEK)	78-93-3	2700000	1000	11 U	11 U	9.8 **J**	6.0 U	12 U	16 U	12 U	12 **J**
2-CHLOROTOLUENE	95-49-8	160000		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
2-HEXANONE	591-78-6	20000	360	11 U	11 U	12 UJ	6.0 U	12 U	16 U	12 U	14 U
4-CHLOROTOLUENE	106-43-4	160000		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
4-ISOPROPYLTOLUENE	99-87-6	190000	10	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	11 U	11 U	12 UJ	6.0 U	12 U	16 U	12 U	14 U
ACETONE	67-64-1	6100000	40	**59**	**23**	**390 J**	6.0 U	**7.9 J**	16 U	12 U	**250**
ACRYLONITRILE	107-13-1			---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	120	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
BROMOBENZENE	108-86-1	29000		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
BROMOMETHANE	74-83-9			4.4 U	4.3 U	5.0 UJ	2.4 U	4.6 U	6.5 U	5 U	5.5 U
BROMOCHLOROMETHANE	74-97-5	15000		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
BROMODICHLOROMETHANE	75-27-4	290	540	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
BROMOFORM	75-25-2	19000	70	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
CARBON DISULFIDE	75-15-0	77000	5	2.2 U	2.2 U	**0.86 J**	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
CARBON TETRACHLORIDE	56-23-5	650	50	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
CHLOROBENZENE	108-90-7	28000	2400	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
CHLOROETHANE	75-00-3	1400000		4.4 U	4.3 U	5.0 UJ	2.4 U	4.6 U	6.5 U	5.0 U	5.5 U
CHLOROFORM	67-66-3	320	50	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
CHLOROMETHANE	74-87-3	11000	10400	4.4 U	4.3 U	5.0 UJ	2.4 U	4.6 U	6.5 U	5.0 U	5.5 U
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
CIS-1,3-DICHLOROPROPENE	10061-01-5		398	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
DIBROMOCHLOROMETHANE	124-48-1	8300		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
DIBROMOMETHANE	74-95-3	2400	65000	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	4.4 U	4.3 U	5.0 UJ	2.4 U	4.6 U	6.5 U	5 U	5.5 U
DIETHYLETHER	60-29-7			---	---	---	---	---	---	---	---
DIISOPROPYL ETHER	108-20-3			---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
HEXACHLOROBUTADIENE	87-68-3	1200	9	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
ISOPROPYLBENZENE	98-82-8	190000	40	2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
METHYL BROMIDE	74-83-9			4.4 U	4.3 U	5.0 UJ	2.4 U	4.6 U	6.5 U	5.0 U	5.5 U
METHYL TERT-BUTYL ETHER	1634-04-4	47000		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
METHYLENE CHLORIDE	75-09-2	35000	210	11 U	11 U	12 UJ	6.0 U	12 U	16 U	12 U	14 U
NAPHTHALENE	91-20-3	3800	20000	10 U	9.5 U	11 U	10 UJ	**7.5 J**	11 UJ	8.6 UJ	8.7 UJ
N-BUTYL BENZENE	104-51-8	390000		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
N-PROPYL BENZENE	103-65-1	380000		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-323		SB-324		SB-325		SB-326	
				SAMPLE ID	SB-323-CI19-0-1	SB-323-CI19-1-3	SB-324-CI19-0-1	SB-324-CI19-1-3	SB-325-CI19-0-1	SB-325-CI19-1-3	SB-326-CI19-0-1	SB-326-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER								
ANALYTE	**CAS**	**HH**	**ECO**									
VOCs (µg/kg)												
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6				2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
SEC-BUTYL BENZENE	135-98-8	780000			2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
STYRENE	100-42-5	600000	1200		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
TERT-AMYL METHYL ETHER	994-05-8				---	---	---	---	---	---	---	---
TERT-BUTYL ALCOHOL	75-65-0				---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000			2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
TERT-BUTYLETHYL ETHER	637-92-3				---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
TETRAHYDROFURAN	109-99-9	1800			11 U	11 U	12 UJ	6 U	12 U	16 U	12 U	14 U
TOLUENE	108-88-3	490000	150		2.2 U	2.2 U	**2.5 J**	1.2 U	2.3 U	**2.7 J**	2.5 U	**2.3 J**
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
TRANS-1,3-DICHLOROPROPENE	10061-02-6		398		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
TRANS-1,4-DICHLORO-2-BUTENE	764-41-0				---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400		4.4 U	4.3 U	5.0 UJ	2.4 U	4.6 U	6.5 U	5.0 U	5.5 U
VINYL CHLORIDE	75-01-4	59	30		4.4 U	4.3 U	5.0 UJ	2.4 U	4.6 U	6.5 U	5.0 U	5.5 U
XYLENE O	95-47-6	65000	100		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
XYLENE P,M	179601-23-1		100		4.4 U	4.3 U	5.0 UJ	2.4 U	4.6 U	6.5 U	5.0 U	5.5 U
TOTAL XYLENES	1330-20-7	58000			2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	3.2 U	2.5 U	2.8 U
SVOC (µg/kg)												
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270		260 U	2.2 U	2.5 UJ	1.2 U	260 U	3.2 U	210 U	220 U
1,2-DICHLOROBENZENE	95-50-1	180000	90		2.2 U	2.2 U	2.5 UJ	1.2 U	260 U	280 U	210 U	220 U
1,3-DICHLOROBENZENE	541-73-1		80		2.2 U	240 U	260 U	1.2 U	260 U	280 U	210 U	2.8 U
1,4-DICHLOROBENZENE	106-46-7	2600	880		2.2 U	2.2 U	2.5 UJ	1.2 U	2.3 U	280 U	210 U	220 U
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000			260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819		640 U	580 U	650 U	620 U	640 U	700 U	530 U	530 U
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
2,4-DICHLOROPHENOL	120-83-2	19000	20000		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
2,4-DIMETHYLPHENOL	105-67-9	130000	400000		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
2,4-DINITROPHENOL	51-28-5	13000	61		640 U	580 U	650 U	620 U	640 U	700 U	530 U	530 U
2,4-DINITROTOLUENE	121-14-2	1700	6000		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
2,6-DINITROTOLUENE	606-20-2	360	4000		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
2-CHLORONAPHTHALENE	91-58-7	480000	12.2		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
2-CHLOROPHENOL	95-57-8	39000	60		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
2-NITROANILINE	88-74-4	63000	20		640 U	580 U	650 U	620 U	640 U	700 U	530 U	530 U
2-NITROPHENOL	88-75-5		1600		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
3-NITROANILINE	99-09-2		3160		640 U	580 U	650 U	620 U	640 U	700 U	530 U	530 U
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144		640 U	580 U	650 U	620 U	640 U	700 U	530 U	530 U
4-BROMOPHENYL PHENYL ETHER	101-55-3				260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
4-CHLORO-3-METHYLPHENOL	59-50-7	630000			260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
4-CHLOROANILINE	106-47-8	2700	1000		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
4-CHLOROPHENYL PHENYL ETHER	7005-72-3				260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
4-NITROANILINE	100-01-6	25000	21900		640 U	580 U	650 U	620 U	640 U	700 U	530 U	530 U
4-NITROPHENOL	100-02-7		5120		640 U	580 U	650 U	620 U	640 U	700 U	530 U	530 U
BENZOIC ACID	65-85-0	25000000	10		640 UJ	580 UJ	650 UJ	620 UJ	640 UJ	700 UJ	530 UJ	530 UJ
BENZYL ALCOHOL	100-51-6	630000	2		510 U	470 U	530 U	500 U	520 U	560 U	430 U	430 U
BENZYL BUTYL PHTHALATE	85-68-7	290000	590		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000			260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230			260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
CARBAZOLE	86-74-8		70		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
CRESOLS, M- & P-					260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
DIBENZOFURAN	132-64-9	7300	150		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
DIETHYL PHTHALATE	84-66-2	5100000	250		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
DIMETHYL PHTHALATE	131-11-3		100000		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
DI-N-BUTYL PHTHALATE	84-74-2	630000	11		260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-323		SB-324		SB-325		SB-326	
				SAMPLE ID	SB-323-CI19-0-1	SB-323-CI19-1-3	SB-324-CI19-0-1	SB-324-CI19-1-3	SB-325-CI19-0-1	SB-325-CI19-1-3	SB-326-CI19-0-1	SB-326-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER								
ANALYTE	**CAS**	**HH**	**ECO**									
SVOC (µg/kg)												
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
HEXACHLOROBENZENE	118-74-1	210	79	260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
HEXACHLOROETHANE	67-72-1	1800	24	260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
ISOPHORONE	78-59-1	570000	139000	260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
NITROBENZENE	98-95-3	5100	2200	260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
PENTACHLOROPHENOL	87-86-5	1000	2100	640 U	580 U	650 U	620 U	640 U	700 U	530 U	530 U
PHENOL	108-95-2	1900000	30000	260 U	240 U	260 U	250 U	260 U	280 U	210 U	220 U
PAHs (µg/kg)												
1-METHYLNAPHTHALENE	90-12-0	18000	140	10 U	9.5 U	11 U	10 UJ	10 UJ	11 UJ	8.6 UJ	8.7 UJ
2-METHYLNAPHTHALENE	91-57-6	24000	110	10 U	9.5 U	11 U	**7.0 J**	**9.4 J**	11 UJ	8.6 UJ	8.7 UJ
ACENAPHTHENE	83-32-9	360000	250	10 U	9.5 U	11 U	10 UJ	10 UJ	11 UJ	8.6 UJ	8.7 UJ
ACENAPHTHYLENE	208-96-8	360000	340	10 U	9.5 U	11 U	10 UJ	10 UJ	11 UJ	8.6 UJ	8.7 UJ
ANTHRACENE	120-12-7	1800000	1.5	**3.4 J**	**2.0 J**	**1.3 J**	**4.4 J**	**11 J**	11 UJ	**1.1 J**	8.7 UJ
BENZO(A)ANTHRACENE	56-55-3	1100	1100	**17 J**	**24**	**12 J**	**33 J**	**80 J**	11 UJ	**10 J**	8.7 UJ
BENZO(A)PYRENE	50-32-8	110	1100	**15 J**	**15 J**	**15 J**	**29 J**	**83 J**	11 UJ	**9.2 J**	8.7 UJ
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	**23**	**40**	**29**	**44 J**	**120 J**	11 UJ	**14 J**	8.7 UJ
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	**9.3 J**	**12 J**	**12 J**	**22 J**	**59 J**	11 UJ	**8.5 J**	8.7 UJ
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	**9.5 J**	**14 J**	**11 J**	**23 J**	**56 J**	11 UJ	**7.2 J**	8.7 UJ
CHRYSENE	218-01-9	110000	1100	**17 J**	**24**	**22**	**34 J**	**72 J**	11 UJ	**11 J**	8.7 UJ
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	**2.9 J**	**4.1 J**	**3.2 J**	**6.2 J**	**17 J**	11 UJ	8.6 UJ	8.7 UJ
FLUORANTHENE	206-44-0	240000	29000	**29**	**23**	**31**	**48 J**	**120 J**	11 UJ	**12 J**	8.7 UJ
FLUORENE	86-73-7	240000	30000	10 U	9.5 U	11 U	10 UJ	**4.3 J**	11 UJ	8.6 UJ	8.7 UJ
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	**12 J**	**16 J**	**16 J**	**25 J**	**72 J**	11 UJ	**8.0 J**	8.7 UJ
NAPHTHALENE	91-20-3	2000	160	10 U	9.5 U	11 U	10 UJ	**7.5 J**	11 UJ	8.6 UJ	8.7 UJ
PHENANTHRENE	85-01-8	180000	29000	**16 J**	**10 J**	**14 J**	**29 J**	**66 J**	11 UJ	**7.1 J**	8.7 UJ
PYRENE	129-00-0	180000	1100	**27**	**22**	**30**	**42 J**	**110 J**	11 UJ	**14 J**	8.7 UJ
TPH (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS				---	---	---	---	---	---	---	---
VPH (µg/kg)												
C5-C8 ALIPHATICS		52000		---	---	---	---	---	---	---	---
C9-C10 AROMATICS		9700		---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS		9600		---	---	---	---	---	---	---	---
EPH (µg/kg)												
C11-C22 AROMATICS		9700		---	---	---	---	---	---	---	---
C11-C22 UNAJUSTED AROMATICS				---	---	---	---	---	---	---	---
C19-C36 ALIPHATICS		23000000		---	---	---	---	---	---	---	---
C9-C18 ALIPHATICS		9600		---	---	---	---	---	---	---	---
PCBs (µg/kg)												
AROCLOR 1016	12674-11-2	410		---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2	200		---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5	170		---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9	230		---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6	230		---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1	120		---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5	240	20	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	120	20	---	---	---	---	---	---	---	---
METALS (mg/kg)												
ALUMINUM	7429-90-5	7700		**9200**	**6060**	**11600**	**5050**	**5480**	**2100**	**6820**	**4410**
ANTIMONY	7440-36-0	3.1	0.27	**0.028 J**	**0.048 J**	**0.046 J**	**0.087**	**0.185**	**0.030 J**	**0.040 J**	**4.6**
ARSENIC	7440-38-2	0.68	18	**1.94**	**1.49**	**2.21**	**1.65**	**1.75**	**0.610**	**1.48**	**7.66**
BARIUM	7440-39-3	1500	330	**26.2**	**18.1**	**18.6**	**16.1**	**15.0**	**3.82**	**8.79**	**152**
BERYLLIUM	7440-41-7	16	10	**0.518**	**0.473**	**0.519**	**0.38**	**0.395**	**0.259**	**0.447**	**4.15**
CADMIUM	7440-43-9	7.1	0.36	**0.083 J**	**0.255**	**0.0849**	**1.37**	**0.496**	**0.0644 J**	0.078 U	**18.0**
CALCIUM	7440-70-2			**955**	**614**	**495**	**447**	**473**	**230**	**255**	**522**
CHROMIUM	7440-47-3	12000	0.4	**6.10**	**5.02**	**8.01**	**6.09**	**15.4**	**1.48**	**5.42**	**17.6**

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-323		SB-324		SB-325		SB-326	
				SAMPLE ID	SB-323-CI19-0-1	SB-323-CI19-1-3	SB-324-CI19-0-1	SB-324-CI19-1-3	SB-325-CI19-0-1	SB-325-CI19-1-3	SB-326-CI19-0-1	SB-326-CI19-1-3
				SAMPLE DATE	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19	7-Oct-19
				QC IDENTIFIER								
ANALYTE	**CAS**	**HH**	**ECO**									
METALS (mg/kg)												
COBALT	7440-48-4	2.3	2.4	**2.71**	**2.05**	**1.91**	**1.86**	**2.36**	**2.12**	**2.64**	**37.4**
COPPER	7440-50-8	310	28	**4.35**	**6.00**	**2.99**	**8.54**	**24.3**	**1.94**	**8.58**	**23.2**
IRON	7439-89-6	5500		**10100**	**7220**	**9560**	**6400**	**10500**	**3960**	**10000**	**7880**
LEAD	7439-92-1	400	11	**7.17**	**17.9**	**11.8**	**44.5**	**51.0**	**1.93**	**7.33**	**12.0**
MAGNESIUM	7439-95-4			**1810**	**1270**	**1010**	**779**	**1080**	**286**	**1230**	**1450**
MANGANESE	7439-96-5	180	220	**248**	**153**	**94.9**	**75.5**	**96.1**	**55.7**	**75.4**	**116**
MERCURY	7439-97-6	2.3	0.013	**0.026 J**	**0.033 J**	**0.029 J**	**0.043**	**0.026 J**	0.016 U	**0.016 J**	**0.0082 J**
NICKEL	7440-02-0	150	38	**3.76**	**3.38**	**4.69**	**4.21**	**15.8**	**1.76**	**5.34**	**3.87**
POTASSIUM	7440-09-7			**1160**	**708**	**608**	**362**	**479**	**238**	**308**	**472**
SELENIUM	7782-49-2	39	0.52	**0.18 J**	**0.089 J**	**0.37 J**	**0.11 J**	**0.14 J**	0.23 U	**0.26 J**	**0.073 J**
SILVER	7440-22-4	39	4.2	**0.021 J**	**0.0526 J**	**0.029 J**	**0.108**	**0.0864**	**0.0088 J**	0.078 U	0.074 U
SODIUM	7440-23-5			**54.1 J**	**39.4 J**	**39.0 J**	**26.2 J**	**33.4 J**	**16.0 J**	78.0 U	74.0 U
THALLIUM	7440-28-0	0.078	0.22	**0.133**	**0.0897**	**0.11**	**0.0657**	**0.0655**	**0.03 J**	**0.06 J**	**0.051 J**
VANADIUM	7440-62-2	39	2	**14.9**	**8.92**	**15.1**	**7.17**	**8.08**	**2.70**	**7.54**	**4.93**
ZINC	7440-66-6	2300	46	**30.4**	**29.3**	**26.5**	**38.6**	**46.1**	**13.2**	**29.7**	**22.9**
TOC (mg/kg)												
TOTAL ORGANIC CARBON				---	---	**20000 J**	**5000 J**	---	---	**9200 J**	**8800 J**

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efro
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	ISM-UPS						ISM-BG5					
				SAMPLE ID	ISM-UPS-1-CI19-0-1	ISM-UPS-1-CI19-1-3	ISM-UPS-2-CI19-0-1	ISM-UPS-2-CI19-1-3	ISM-UPS-3-CI19-0-1	ISM-UPS-3-CI19-1-3	ISM-BG5-1-CI19-0-1	ISM-BG5-2-CI19-0-1	ISM-BG5-3-CI19-0-1	ISM-BG5-1-CI19-1-3	ISM-BG5-2-CI19-1-3	ISM-BG5-3-CI19-1-3
				SAMPLE DATE	8-Oct-19	8-Oct-19	8-Oct-19	8-Oct-19	8-Oct-19	8-Oct-19	10-Oct-19	10-Oct-19	10-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**													
VOCs (µg/kg)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	---	---	---	---	---	---	---	---	---	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	---	---	---	---	---	---	---	---	---	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	---	---	---	---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHAN	76-13-1	670000		---	---	---	---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	320	---	---	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	140	---	---	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	40	---	---	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6			---	---	---	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	---	---	---	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	---	---	---	---	---	---	---	---	---	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	---	---	---	---	---	---	---	---	---	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	---	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	---	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	1230	---	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	---	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	400	---	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	280	---	---	---	---	---	---	---	---	---	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	---	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1		80	---	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000		---	---	---	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	---	---	---	---	---	---	---	---	---	---	---	---	---
1,4-DIOXANE	123-91-1			---	---	---	---	---	---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7			---	---	---	---	---	---	---	---	---	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	1000	---	---	---	---	---	---	---	---	---	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000		---	---	---	---	---	---	---	---	---	---	---	---	---
2-HEXANONE	591-78-6	20000	360	---	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000		---	---	---	---	---	---	---	---	---	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	10	---	---	---	---	---	---	---	---	---	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	---	---	---	---	---	---	---	---	---	---	---	---	---
ACETONE	67-64-1	6100000	40	---	---	---	---	---	---	---	---	---	---	---	---	---
ACRYLONITRILE	107-13-1			---	---	---	---	---	---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	120	---	---	---	---	---	---	---	---	---	---	---	---	---
BROMOBENZENE	108-86-1	29000		---	---	---	---	---	---	---	---	---	---	---	---	---
BROMOMETHANE	74-83-9			---	---	---	---	---	---	---	---	---	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000		---	---	---	---	---	---	---	---	---	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	540	---	---	---	---	---	---	---	---	---	---	---	---	---
BROMOFORM	75-25-2	19000	70	---	---	---	---	---	---	---	---	---	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	5	---	---	---	---	---	---	---	---	---	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	50	---	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROBENZENE	108-90-7	28000	2400	---	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROETHANE	75-00-3	1400000		---	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROFORM	67-66-3	320	50	---	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROMETHANE	74-87-3	11000	10400	---	---	---	---	---	---	---	---	---	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	---	---	---	---	---	---	---	---	---	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5		398	---	---	---	---	---	---	---	---	---	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300		---	---	---	---	---	---	---	---	---	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	65000	---	---	---	---	---	---	---	---	---	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	---	---	---	---	---	---	---	---	---	---	---	---	---
DIETHYLETHER	60-29-7			---	---	---	---	---	---	---	---	---	---	---	---	---
DIISOPROPYL ETHER	108-20-3			---	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	---	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBUTADIENE	87-68-3	1200	9	---	---	---	---	---	---	---	---	---	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	40	---	---	---	---	---	---	---	---	---	---	---	---	---
METHYL BROMIDE	74-83-9			---	---	---	---	---	---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000		---	---	---	---	---	---	---	---	---	---	---	---	---
METHYLENE CHLORIDE	75-09-2	35000	210	---	---	---	---	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	3800	20000	---	---	---	---	---	---	---	---	---	---	---	---	---
N-BUTYL BENZENE	104-51-8	390000		---	---	---	---	---	---	---	---	---	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000		---	---	---	---	---	---	---	---	---	---	---	---	---

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	ISM-UPS						ISM-BG5					
				SAMPLE ID	ISM-UPS-1-CI19-0-1	ISM-UPS-1-CI19-1-3	ISM-UPS-2-CI19-0-1	ISM-UPS-2-CI19-1-3	ISM-UPS-3-CI19-0-1	ISM-UPS-3-CI19-1-3	ISM-BG5-1-CI19-0-1	ISM-BG5-2-CI19-0-1	ISM-BG5-3-CI19-0-1	ISM-BG5-1-CI19-1-3	ISM-BG5-2-CI19-1-3	ISM-BG5-3-CI19-1-3
				SAMPLE DATE	8-Oct-19	8-Oct-19	8-Oct-19	8-Oct-19	8-Oct-19	8-Oct-19	10-Oct-19	10-Oct-19	10-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**													
VOCs (µg/kg)																
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6			---	---	---	---	---	---	---	---	---	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000		---	---	---	---	---	---	---	---	---	---	---	---	---
STYRENE	100-42-5	600000	1200	---	---	---	---	---	---	---	---	---	---	---	---	---
TERT-AMYL METHYL ETHER	994-05-8			---	---	---	---	---	---	---	---	---	---	---	---	---
TERT-BUTYL ALCOHOL	75-65-0			---	---	---	---	---	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000		---	---	---	---	---	---	---	---	---	---	---	---	---
TERT-BUTYLETHYL ETHER	637-92-3			---	---	---	---	---	---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60	---	---	---	---	---	---	---	---	---	---	---	---	---
TETRAHYDROFURAN	109-99-9	1800		---	---	---	---	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	490000	150	---	---	---	---	---	---	---	---	---	---	---	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	---	---	---	---	---	---	---	---	---	---	---	---	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6		398	---	---	---	---	---	---	---	---	---	---	---	---	---
TRANS-1,4-DICHLORO-2-BUTENE	764-41-0			---	---	---	---	---	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60	---	---	---	---	---	---	---	---	---	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	---	---	---	---	---	---	---	---	---	---	---	---	---
VINYL CHLORIDE	75-01-4	59	30	---	---	---	---	---	---	---	---	---	---	---	---	---
XYLENE O	95-47-6	65000	100	---	---	---	---	---	---	---	---	---	---	---	---	---
XYLENE P,M	179601-23-1		100	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL XYLENES	1330-20-7	58000		---	---	---	---	---	---	---	---	---	---	---	---	---
SVOC (µg/kg)																
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	---	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	---	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1		80	---	---	---	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	---	---	---	---	---	---	---	---	---	---	---	---	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000		---	---	---	---	---	---	---	---	---	---	---	---	---
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	---	---	---	---	---	---	---	---	---	---	---	---	---
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	---	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DICHLOROPHENOL	120-83-2	19000	20000	---	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	---	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DINITROPHENOL	51-28-5	13000	61	---	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DINITROTOLUENE	121-14-2	1700	6000	---	---	---	---	---	---	---	---	---	---	---	---	---
2,6-DINITROTOLUENE	606-20-2	360	4000	---	---	---	---	---	---	---	---	---	---	---	---	---
2-CHLORONAPHTHALENE	91-58-7	480000	12.2	---	---	---	---	---	---	---	---	---	---	---	---	---
2-CHLOROPHENOL	95-57-8	39000	60	---	---	---	---	---	---	---	---	---	---	---	---	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	---	---	---	---	---	---	---	---	---	---	---	---	---
2-NITROANILINE	88-74-4	63000	20	---	---	---	---	---	---	---	---	---	---	---	---	---
2-NITROPHENOL	88-75-5		1600	---	---	---	---	---	---	---	---	---	---	---	---	---
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	---	---	---	---	---	---	---	---	---	---	---	---	---
3-NITROANILINE	99-09-2		3160	---	---	---	---	---	---	---	---	---	---	---	---	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	---	---	---	---	---	---	---	---	---	---	---	---	---
4-BROMOPHENYL PHENYL ETHER	101-55-3			---	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLORO-3-METHYLPHENOL	59-50-7	630000		---	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROANILINE	106-47-8	2700	1000	---	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3			---	---	---	---	---	---	---	---	---	---	---	---	---
4-NITROANILINE	100-01-6	25000	21900	---	---	---	---	---	---	---	---	---	---	---	---	---
4-NITROPHENOL	100-02-7		5120	---	---	---	---	---	---	---	---	---	---	---	---	---
BENZOIC ACID	65-85-0	25000000	10	---	---	---	---	---	---	---	---	---	---	---	---	---
BENZYL ALCOHOL	100-51-6	630000	2	---	---	---	---	---	---	---	---	---	---	---	---	---
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	---	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000		---	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230		---	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20	---	---	---	---	---	---	---	---	---	---	---	---	---
CARBAZOLE	86-74-8		70	---	---	---	---	---	---	---	---	---	---	---	---	---
CRESOLS, M- & P-				---	---	---	---	---	---	---	---	---	---	---	---	---
DIBENZOFURAN	132-64-9	7300	150	---	---	---	---	---	---	---	---	---	---	---	---	---
DIETHYL PHTHALATE	84-66-2	5100000	250	---	---	---	---	---	---	---	---	---	---	---	---	---
DIMETHYL PHTHALATE	131-11-3		100000	---	---	---	---	---	---	---	---	---	---	---	---	---
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	ISM-UPS						ISM-BG5					
				SAMPLE ID	ISM-UPS-1-CI19-0-1	ISM-UPS-1-CI19-1-3	ISM-UPS-2-CI19-0-1	ISM-UPS-2-CI19-1-3	ISM-UPS-3-CI19-0-1	ISM-UPS-3-CI19-1-3	ISM-BG5-1-CI19-0-1	ISM-BG5-2-CI19-0-1	ISM-BG5-3-CI19-0-1	ISM-BG5-1-CI19-1-3	ISM-BG5-2-CI19-1-3	ISM-BG5-3-CI19-1-3
				SAMPLE DATE	8-Oct-19	8-Oct-19	8-Oct-19	8-Oct-19	8-Oct-19	8-Oct-19	10-Oct-19	10-Oct-19	10-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**													
SVOC (µg/kg)																
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	---	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBENZENE	118-74-1	210	79	---	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROETHANE	67-72-1	1800	24	---	---	---	---	---	---	---	---	---	---	---	---	---
ISOPHORONE	78-59-1	570000	139000	---	---	---	---	---	---	---	---	---	---	---	---	---
NITROBENZENE	98-95-3	5100	2200	---	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	---	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	---	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	---	---	---	---	---	---	---	---	---	---	---	---	---
PENTACHLOROPHENOL	87-86-5	1000	2100	---	---	---	---	---	---	---	---	---	---	---	---	---
PHENOL	108-95-2	1900000	30000	---	---	---	---	---	---	---	---	---	---	---	---	---
PAHs (µg/kg)																
1-METHYLNAPHTHALENE	90-12-0	18000	140	---	---	---	---	---	---	---	---	---	---	---	---	---
2-METHYLNAPHTHALENE	91-57-6	24000	110	---	---	---	---	---	---	---	---	---	---	---	---	---
ACENAPHTHENE	83-32-9	360000	250	---	---	---	---	---	---	---	---	---	---	---	---	---
ACENAPHTHYLENE	208-96-8	360000	340	---	---	---	---	---	---	---	---	---	---	---	---	---
ANTHRACENE	120-12-7	1800000	1.5	---	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(A)ANTHRACENE	56-55-3	1100	1100	---	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(A)PYRENE	50-32-8	110	1100	---	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	---	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	---	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	---	---	---	---	---	---	---	---	---	---	---	---	---
CHRYSENE	218-01-9	110000	1100	---	---	---	---	---	---	---	---	---	---	---	---	---
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	---	---	---	---	---	---	---	---	---	---	---	---	---
FLUORANTHENE	206-44-0	240000	29000	---	---	---	---	---	---	---	---	---	---	---	---	---
FLUORENE	86-73-7	240000	30000	---	---	---	---	---	---	---	---	---	---	---	---	---
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	---	---	---	---	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	2000	160	---	---	---	---	---	---	---	---	---	---	---	---	---
PHENANTHRENE	85-01-8	180000	29000	---	---	---	---	---	---	---	---	---	---	---	---	---
PYRENE	129-00-0	180000	1100	---	---	---	---	---	---	---	---	---	---	---	---	---
TPH (mg/kg)																
TOTAL PETROLEUM HYDROCARBONS				---	---	---	---	---	---	---	---	---	---	---	---	---
VPH (µg/kg)																
C5-C8 ALIPHATICS		52000		---	---	---	---	---	---	---	---	---	---	---	---	---
C9-C10 AROMATICS		9700		---	---	---	---	---	---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS		9600		---	---	---	---	---	---	---	---	---	---	---	---	---
EPH (µg/kg)																
C11-C22 AROMATICS		9700		---	---	---	---	---	---	---	---	---	---	---	---	---
C11-C22 UNAJUSTED AROMATICS				---	---	---	---	---	---	---	---	---	---	---	---	---
C19-C36 ALIPHATICS		23000000		---	---	---	---	---	---	---	---	---	---	---	---	---
C9-C18 ALIPHATICS		9600		---	---	---	---	---	---	---	---	---	---	---	---	---
PCBs (µg/kg)																
AROCLOR 1016	12674-11-2	410		8.4 U	8.0 U	7.8 U	7.7 U	8.4 U	8.1 U	8.1 U	8.4 U	8.5 U	8.1 U	8.5 UJ	8.0 U
AROCLOR 1221	11104-28-2	200		8.4 U	8.0 U	7.8 U	7.7 U	8.4 U	8.1 U	8.1 U	8.4 U	8.5 U	8.1 U	8.5 UJ	8.0 U
AROCLOR 1232	11141-16-5	170		9.8 U	9.4 U	9.2 U	9.0 U	9.9 U	9.5 U	9.6 U	9.8 U	10 U	9.6 U	10 UJ	9.4 U
AROCLOR 1242	53469-21-9	230		8.4 U	8.0 U	7.8 U	7.7 U	8.4 U	8.1 U	8.1 U	8.4 U	8.5 U	8.1 U	8.5 UJ	8.0 U
AROCLOR 1248	12672-29-6	230		8.4 U	8.0 U	7.8 U	7.7 U	8.4 U	8.1 U	8.1 U	8.4 U	8.5 U	8.1 U	8.5 UJ	8.0 U
AROCLOR 1254	11097-69-1	120		8.4 U	8.0 U	7.8 U	7.7 U	8.4 U	8.1 U	8.1 U	8.4 U	**63**	8.1 U	8.5 UJ	8.0 U
AROCLOR 1260	11096-82-5	240	20	**200**	**48**	**220**	**66**	**140**	**22**	**70**	**120**	**91**	**29**	**24 J**	**12 J**
TOTAL PCBS	1336-36-3	120	20	**200**	**48 J**	**220**	**66 J**	**140**	**22 J**	**70 J**	**120**	**154**	**29 J**	**24 J**	**12 J**
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700		---	---	---	---	---	---	---	---	---	---	---	---	---
ANTIMONY	7440-36-0	3.1	0.27	---	---	---	---	---	---	---	---	---	---	---	---	---
ARSENIC	7440-38-2	0.68	18	---	---	---	---	---	---	---	---	---	---	---	---	---
BARIUM	7440-39-3	1500	330	---	---	---	---	---	---	---	---	---	---	---	---	---
BERYLLIUM	7440-41-7	16	10	---	---	---	---	---	---	---	---	---	---	---	---	---
CADMIUM	7440-43-9	7.1	0.36	---	---	---	---	---	---	---	---	---	---	---	---	---
CALCIUM	7440-70-2			---	---	---	---	---	---	---	---	---	---	---	---	---
CHROMIUM	7440-47-3	12000	0.4	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	ISM-UPS						ISM-BG5					
			SAMPLE ID	ISM-UPS-1-CI19-0-1	ISM-UPS-1-CI19-1-3	ISM-UPS-2-CI19-0-1	ISM-UPS-2-CI19-1-3	ISM-UPS-3-CI19-0-1	ISM-UPS-3-CI19-1-3	ISM-BG5-1-CI19-0-1	ISM-BG5-2-CI19-0-1	ISM-BG5-3-CI19-0-1	ISM-BG5-1-CI19-1-3	ISM-BG5-2-CI19-1-3	ISM-BG5-3-CI19-1-3
			SAMPLE DATE	8-Oct-19	8-Oct-19	8-Oct-19	8-Oct-19	8-Oct-19	8-Oct-19	10-Oct-19	10-Oct-19	10-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19
			QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**												
METALS (mg/kg)															
COBALT	7440-48-4	2.3	2.4	---	---	---	---	---	---	---	---	---	---	---	---
COPPER	7440-50-8	310	28	---	---	---	---	---	---	---	---	---	---	---	---
IRON	7439-89-6	5500		---	---	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	400	11	---	---	---	---	---	---	---	---	---	---	---	---
MAGNESIUM	7439-95-4			---	---	---	---	---	---	---	---	---	---	---	---
MANGANESE	7439-96-5	180	220	---	---	---	---	---	---	---	---	---	---	---	---
MERCURY	7439-97-6	2.3	0.013	---	---	---	---	---	---	---	---	---	---	---	---
NICKEL	7440-02-0	150	38	---	---	---	---	---	---	---	---	---	---	---	---
POTASSIUM	7440-09-7			---	---	---	---	---	---	---	---	---	---	---	---
SELENIUM	7782-49-2	39	0.52	---	---	---	---	---	---	---	---	---	---	---	---
SILVER	7440-22-4	39	4.2	---	---	---	---	---	---	---	---	---	---	---	---
SODIUM	7440-23-5			---	---	---	---	---	---	---	---	---	---	---	---
THALLIUM	7440-28-0	0.078	0.22	---	---	---	---	---	---	---	---	---	---	---	---
VANADIUM	7440-62-2	39	2	---	---	---	---	---	---	---	---	---	---	---	---
ZINC	7440-66-6	2300	46	---	---	---	---	---	---	---	---	---	---	---	---
TOC (mg/kg)															
TOTAL ORGANIC CARBON				---	---	---	---	---	---	---	---	---	---	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efro
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	ISM-BG1						SB-BG	
			SAMPLE ID	ISM-BG1-1-CI19-0-1	ISM-BG1-2-CI19-0-1	ISM-BG1-3-CI19-0-1	ISM-BG1-1-CI19-1-3	ISM-BG1-2-CI19-1-3	ISM-BG1-3-CI19-1-3	SB-BG-1-CI19-0-1	SB-BG-1-CI19-1-3
			SAMPLE DATE	10-Oct-19	10-Oct-19	10-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19
			QC IDENTIFIER								
ANALYTE	**CAS**	**HH**	**ECO**								
VOCs (µg/kg)											
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	---	---	---	---	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	---	---	---	---	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	---	---	---	---	---	---	---	---
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHAN	76-13-1	670000		---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	320	---	---	---	---	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	140	---	---	---	---	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	40	---	---	---	---	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6			---	---	---	---	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	---	---	---	---	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	---	---	---	---	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	---	---	---	---	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	---	---	---	---	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	1230	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	---	---	---	---	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	400	---	---	---	---	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	280	---	---	---	---	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1		80	---	---	---	---	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000		---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	---	---	---	---	---	---	---	---
1,4-DIOXANE	123-91-1			---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7			---	---	---	---	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	1000	---	---	---	---	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000		---	---	---	---	---	---	---	---
2-HEXANONE	591-78-6	20000	360	---	---	---	---	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000		---	---	---	---	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	10	---	---	---	---	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	---	---	---	---	---	---	---	---
ACETONE	67-64-1	6100000	40	---	---	---	---	---	---	---	---
ACRYLONITRILE	107-13-1			---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	120	---	---	---	---	---	---	---	---
BROMOBENZENE	108-86-1	29000		---	---	---	---	---	---	---	---
BROMOMETHANE	74-83-9			---	---	---	---	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000		---	---	---	---	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	540	---	---	---	---	---	---	---	---
BROMOFORM	75-25-2	19000	70	---	---	---	---	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	5	---	---	---	---	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	50	---	---	---	---	---	---	---	---
CHLOROBENZENE	108-90-7	28000	2400	---	---	---	---	---	---	---	---
CHLOROETHANE	75-00-3	1400000		---	---	---	---	---	---	---	---
CHLOROFORM	67-66-3	320	50	---	---	---	---	---	---	---	---
CHLOROMETHANE	74-87-3	11000	10400	---	---	---	---	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	---	---	---	---	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5		398	---	---	---	---	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300		---	---	---	---	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	65000	---	---	---	---	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	---	---	---	---	---	---	---	---
DIETHYLETHER	60-29-7			---	---	---	---	---	---	---	---
DIISOPROPYL ETHER	108-20-3			---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	---	---	---	---	---	---	---	---
HEXACHLOROBUTADIENE	87-68-3	1200	9	---	---	---	---	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	40	---	---	---	---	---	---	---	---
METHYL BROMIDE	74-83-9			---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000		---	---	---	---	---	---	---	---
METHYLENE CHLORIDE	75-09-2	35000	210	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	3800	20000	---	---	---	---	---	---	---	---
N-BUTYL BENZENE	104-51-8	390000		---	---	---	---	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000		---	---	---	---	---	---	---	---

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North Kingstown, Rhode Island

			SAMPLE LOCATION	ISM-BG1						SB-BG	
			SAMPLE ID	ISM-BG1-1-CI19-0-1	ISM-BG1-2-CI19-0-1	ISM-BG1-3-CI19-0-1	ISM-BG1-1-CI19-1-3	ISM-BG1-2-CI19-1-3	ISM-BG1-3-CI19-1-3	SB-BG-1-CI19-0-1	SB-BG-1-CI19-1-3
			SAMPLE DATE	10-Oct-19	10-Oct-19	10-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19
			QC IDENTIFIER								
ANALYTE	**CAS**	**HH**	**ECO**								
VOCs (µg/kg)											
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6			---	---	---	---	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000		---	---	---	---	---	---	---	---
STYRENE	100-42-5	600000	1200	---	---	---	---	---	---	---	---
TERT-AMYL METHYL ETHER	994-05-8			---	---	---	---	---	---	---	---
TERT-BUTYL ALCOHOL	75-65-0			---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000		---	---	---	---	---	---	---	---
TERT-BUTYLETHYL ETHER	637-92-3			---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60	---	---	---	---	---	---	---	---
TETRAHYDROFURAN	109-99-9	1800		---	---	---	---	---	---	---	---
TOLUENE	108-88-3	490000	150	---	---	---	---	---	---	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	---	---	---	---	---	---	---	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6		398	---	---	---	---	---	---	---	---
TRANS-1,4-DICHLORO-2-BUTENE	764-41-0			---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60	---	---	---	---	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	---	---	---	---	---	---	---	---
VINYL CHLORIDE	75-01-4	59	30	---	---	---	---	---	---	---	---
XYLENE O	95-47-6	65000	100	---	---	---	---	---	---	---	---
XYLENE P,M	179601-23-1		100	---	---	---	---	---	---	---	---
TOTAL XYLENES	1330-20-7	58000		---	---	---	---	---	---	---	---
SVOC (µg/kg)											
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	---	---	---	---	---	---	260 U	260 U
1,2-DICHLOROBENZENE	95-50-1	180000	90	---	---	---	---	---	---	260 U	260 U
1,3-DICHLOROBENZENE	541-73-1		80	---	---	---	---	---	---	260 U	260 U
1,4-DICHLOROBENZENE	106-46-7	2600	880	---	---	---	---	---	---	260 U	260 U
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000		---	---	---	---	---	---	260 U	260 U
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	---	---	---	---	---	---	640 U	650 U
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	---	---	---	---	---	---	260 U	260 U
2,4-DICHLOROPHENOL	120-83-2	19000	20000	---	---	---	---	---	---	260 U	260 U
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	---	---	---	---	---	---	260 U	260 U
2,4-DINITROPHENOL	51-28-5	13000	61	---	---	---	---	---	---	640 U	650 U
2,4-DINITROTOLUENE	121-14-2	1700	6000	---	---	---	---	---	---	260 U	260 U
2,6-DINITROTOLUENE	606-20-2	360	4000	---	---	---	---	---	---	260 U	260 U
2-CHLORONAPHTHALENE	91-58-7	480000	12.2	---	---	---	---	---	---	260 U	260 U
2-CHLOROPHENOL	95-57-8	39000	60	---	---	---	---	---	---	260 U	260 U
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	---	---	---	---	---	---	260 U	260 U
2-NITROANILINE	88-74-4	63000	20	---	---	---	---	---	---	640 U	650 U
2-NITROPHENOL	88-75-5		1600	---	---	---	---	---	---	260 U	260 U
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	---	---	---	---	---	---	260 U	260 U
3-NITROANILINE	99-09-2		3160	---	---	---	---	---	---	640 U	650 U
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	---	---	---	---	---	---	640 U	650 U
4-BROMOPHENYL PHENYL ETHER	101-55-3			---	---	---	---	---	---	260 U	260 U
4-CHLORO-3-METHYLPHENOL	59-50-7	630000		---	---	---	---	---	---	260 U	260 U
4-CHLOROANILINE	106-47-8	2700	1000	---	---	---	---	---	---	260 U	260 U
4-CHLOROPHENYL PHENYL ETHER	7005-72-3			---	---	---	---	---	---	260 U	260 U
4-NITROANILINE	100-01-6	25000	21900	---	---	---	---	---	---	640 U	650 U
4-NITROPHENOL	100-02-7		5120	---	---	---	---	---	---	640 U	650 U
BENZOIC ACID	65-85-0	25000000	10	---	---	---	---	---	---	640 UJ	650 UJ
BENZYL ALCOHOL	100-51-6	630000	2	---	---	---	---	---	---	510 U	520 U
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	---	---	---	---	---	---	260 U	260 U
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000		---	---	---	---	---	---	260 U	260 U
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230		---	---	---	---	---	---	260 U	260 U
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20	---	---	---	---	---	---	**860**	**360**
CARBAZOLE	86-74-8		70	---	---	---	---	---	---	260 U	260 U
CRESOLS, M- & P-				---	---	---	---	---	---	260 U	260 U
DIBENZOFURAN	132-64-9	7300	150	---	---	---	---	---	---	260 U	260 U
DIETHYL PHTHALATE	84-66-2	5100000	250	---	---	---	---	---	---	260 U	260 U
DIMETHYL PHTHALATE	131-11-3		100000	---	---	---	---	---	---	260 U	260 U
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	---	---	---	---	---	---	260 U	260 U

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				SAMPLE LOCATION	ISM-BG1						SB-BG	
				SAMPLE ID	ISM-BG1-1-CI19-0-1	ISM-BG1-2-CI19-0-1	ISM-BG1-3-CI19-0-1	ISM-BG1-1-CI19-1-3	ISM-BG1-2-CI19-1-3	ISM-BG1-3-CI19-1-3	SB-BG-1-CI19-0-1	SB-BG-1-CI19-1-3
				SAMPLE DATE	10-Oct-19	10-Oct-19	10-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19
				QC IDENTIFIER								
ANALYTE	**CAS**	**HH**	**ECO**									
SVOC (µg/kg)												
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	---	---	---	---	---	---	---	260 U	260 U
HEXACHLOROBENZENE	118-74-1	210	79	---	---	---	---	---	---	---	260 U	260 U
HEXACHLOROETHANE	67-72-1	1800	24	---	---	---	---	---	---	---	260 U	260 U
ISOPHORONE	78-59-1	570000	139000	---	---	---	---	---	---	---	260 U	260 U
NITROBENZENE	98-95-3	5100	2200	---	---	---	---	---	---	---	260 U	260 U
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	---	---	---	---	---	---	---	260 U	260 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	---	---	---	---	---	---	---	260 U	260 U
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	---	---	---	---	---	---	---	260 U	260 U
PENTACHLOROPHENOL	87-86-5	1000	2100	---	---	---	---	---	---	---	640 U	650 U
PHENOL	108-95-2	1900000	30000	---	---	---	---	---	---	---	260 U	260 U
PAHs (µg/kg)												
1-METHYLNAPHTHALENE	90-12-0	18000	140	---	---	---	---	---	---	---	**6.9 J**	**2.2 J**
2-METHYLNAPHTHALENE	91-57-6	24000	110	---	---	---	---	---	---	---	**11 J**	**4.1 J**
ACENAPHTHENE	83-32-9	360000	250	---	---	---	---	---	---	---	10 U	10 U
ACENAPHTHYLENE	208-96-8	360000	340	---	---	---	---	---	---	---	10 U	10 U
ANTHRACENE	120-12-7	1800000	1.5	---	---	---	---	---	---	---	**10 J**	**6.8 J**
BENZO(A)ANTHRACENE	56-55-3	1100	1100	---	---	---	---	---	---	---	**78**	**33**
BENZO(A)PYRENE	50-32-8	110	1100	---	---	---	---	---	---	---	**79**	**29**
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	---	---	---	---	---	---	---	**140**	**55**
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	---	---	---	---	---	---	---	**81**	**24**
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	---	---	---	---	---	---	---	**38**	**18 J**
CHRYSENE	218-01-9	110000	1100	---	---	---	---	---	---	---	**78**	**30**
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	---	---	---	---	---	---	---	**13 J**	10 U
FLUORANTHENE	206-44-0	240000	29000	---	---	---	---	---	---	---	**98**	**40**
FLUORENE	86-73-7	240000	30000	---	---	---	---	---	---	---	10 U	10 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	---	---	---	---	---	---	---	**75**	**25**
NAPHTHALENE	91-20-3	2000	160	---	---	---	---	---	---	---	10 U	**4.9 J**
PHENANTHRENE	85-01-8	180000	29000	---	---	---	---	---	---	---	**65**	**35**
PYRENE	129-00-0	180000	1100	---	---	---	---	---	---	---	**120**	**47**
TPH (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS				---	---	---	---	---	---	---	---	---
VPH (µg/kg)												
C5-C8 ALIPHATICS		52000		---	---	---	---	---	---	---	---	---
C9-C10 AROMATICS		9700		---	---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS		9600		---	---	---	---	---	---	---	---	---
EPH (µg/kg)												
C11-C22 AROMATICS		9700		---	---	---	---	---	---	---	---	---
C11-C22 UNAJUSTED AROMATICS				---	---	---	---	---	---	---	---	---
C19-C36 ALIPHATICS		23000000		---	---	---	---	---	---	---	---	---
C9-C18 ALIPHATICS		9600		---	---	---	---	---	---	---	---	---
PCBs (µg/kg)												
AROCLOR 1016	12674-11-2	410		8.3 U	7.9 U	8.2 U	8.1 U	8.4 U	8.0 U	---	---	
AROCLOR 1221	11104-28-2	200		8.3 U	7.9 U	8.2 U	8.1 U	8.4 U	8.0 U	---	---	
AROCLOR 1232	11141-16-5	170		9.8 U	9.3 U	9.7 U	9.5 U	9.8 U	9.4 U	---	---	
AROCLOR 1242	53469-21-9	230		8.3 U	7.9 U	8.2 U	8.1 U	8.4 U	8.0 U	---	---	
AROCLOR 1248	12672-29-6	230		8.3 U	7.9 U	8.2 U	8.1 U	8.4 U	8.0 U	---	---	
AROCLOR 1254	11097-69-1	120		**200**	**59**	**110**	**210**	**280**	**140**	---	---	
AROCLOR 1260	11096-82-5	240	20	**170**	**120**	**170**	**130**	**94**	**82**	---	---	
TOTAL PCBS	1336-36-3	120	20	**370**	**180**	**280**	**330**	**370**	**220**	---	---	
METALS (mg/kg)												
ALUMINUM	7429-90-5	7700		---	---	---	---	---	---	---	**6210**	**7570**
ANTIMONY	7440-36-0	3.1	0.27	---	---	---	---	---	---	---	**3.14**	**3.75**
ARSENIC	7440-38-2	0.68	18	---	---	---	---	---	---	---	**2.94**	**7.05**
BARIUM	7440-39-3	1500	330	---	---	---	---	---	---	---	**27.0**	**74.3**
BERYLLIUM	7440-41-7	16	10	---	---	---	---	---	---	---	**0.615**	**0.516**
CADMIUM	7440-43-9	7.1	0.36	---	---	---	---	---	---	---	**12.0**	**9.06**
CALCIUM	7440-70-2			---	---	---	---	---	---	---	**466**	**451**
CHROMIUM	7440-47-3	12000	0.4	---	---	---	---	---	---	---	**36.4**	**77.5**

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Table 5-2
Summary of Soil Analytical Data - On-Project Blue Beach Upland Area
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	ISM-BG1						SB-BG	
				SAMPLE ID	ISM-BG1-1-CI19-0-1	ISM-BG1-2-CI19-0-1	ISM-BG1-3-CI19-0-1	ISM-BG1-1-CI19-1-3	ISM-BG1-2-CI19-1-3	ISM-BG1-3-CI19-1-3	SB-BG-1-CI19-0-1	SB-BG-1-CI19-1-3
				SAMPLE DATE	10-Oct-19	10-Oct-19	10-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19	9-Oct-19
				QC IDENTIFIER								
ANALYTE	**CAS**	**HH**	**ECO**									
METALS (mg/kg)												
COBALT	7440-48-4	2.3	2.4	---	---	---	---	---	---	---	**4.14**	**5.39**
COPPER	7440-50-8	310	28	---	---	---	---	---	---	---	**85.5**	**871**
IRON	7439-89-6	5500		---	---	---	---	---	---	---	**13000**	**19000**
LEAD	7439-92-1	400	11	---	---	---	---	---	---	---	**243**	**859**
MAGNESIUM	7439-95-4			---	---	---	---	---	---	---	**1220**	**1420**
MANGANESE	7439-96-5	180	220	---	---	---	---	---	---	---	**147**	**204**
MERCURY	7439-97-6	2.3	0.013	---	---	---	---	---	---	---	**2.14**	**0.936**
NICKEL	7440-02-0	150	38	---	---	---	---	---	---	---	**17.6**	**27.8**
POTASSIUM	7440-09-7			---	---	---	---	---	---	---	**532**	**476**
SELENIUM	7782-49-2	39	0.52	---	---	---	---	---	---	---	**0.17 J**	**0.22 J**
SILVER	7440-22-4	39	4.2	---	---	---	---	---	---	---	**1.00**	**2.29**
SODIUM	7440-23-5			---	---	---	---	---	---	---	75 U	71 U
THALLIUM	7440-28-0	0.078	0.22	---	---	---	---	---	---	---	**0.0824**	**0.0838**
VANADIUM	7440-62-2	39	2	---	---	---	---	---	---	---	**11.1**	**12.7**
ZINC	7440-66-6	2300	46	---	---	---	---	---	---	---	**287**	**277**
TOC (mg/kg)												
TOTAL ORGANIC CARBON				---	---	---	---	---	---	---	**6900**	**13000**

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efro
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	B-12-110502 (S-2)	CDW-1	CDW-2	CDW-3	CDW-5	SB106		SS-1A			SS-2A	
				SAMPLE ID	B-12-110502 (S-2)	MW-11-110502 (S-3)	MW-08-110502 (S-3)	MW-07-110502 (S-3)	MW-01-110502 (S-3)	SB-106A 0-5	SB-106A 3-5	SS-1A 0-1	SS-1A 1-2	SS-1A 1-2DUP	SS-2A 0-1	SS-2A 1-2
				SAMPLE DATE	05-Nov-02	05-Nov-02	05-Nov-02	05-Nov-02	05-Nov-02	21-Nov-11	21-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11
				QC IDENTIFIER									DUPLICATE	DUPLICATE		
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**												
VOCs (µg/kg)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	2200	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	540000	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	320	3600	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	140	920000	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	40	200	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6	--	--	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	96000	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	1230	10	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	400	900	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	280	1900	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	80	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7	--	--	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	1000	--	---	---	---	---	---	---	32.8 U	---	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000	--	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
2-HEXANONE	591-78-6	20000	360	--	---	---	---	---	---	---	32.8 U	---	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000	--	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	10	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	--	---	---	---	---	---	---	32.8 U	---	---	---	---	---
ACETONE	67-64-1	6100000	40	7800000	---	---	---	---	---	---	32.8 U	---	---	---	---	---
BENZENE	71-43-2	1200	120	2500	---	---	---	---	---	---	3.3 U	---	---	---	---	---
BROMOBENZENE	108-86-1	29000	--	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000	--	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	540	10000	---	---	---	---	---	---	3.3 U	---	---	---	---	---
BROMOFORM	75-25-2	19000	70	81000	---	---	---	---	---	---	3.3 U	---	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	5	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	50	1500	---	---	---	---	---	---	3.3 U	---	---	---	---	---
CHLOROBENZENE	108-90-7	28000	2400	210000	---	---	---	---	---	---	3.3 U	---	---	---	---	---
CHLOROETHANE	75-00-3	1400000	--	--	---	---	---	---	---	---	6.6 U	---	---	---	---	---
CHLOROFORM	67-66-3	320	50	1200	---	---	---	---	---	---	3.3 U	---	---	---	---	---
CHLOROMETHANE	74-87-3	11000	10400	--	---	---	---	---	---	---	6.6 U	---	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	630000	---	---	---	---	---	---	**10**	---	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	398	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	---	---	---	---	---	---	3.3 U	---	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	65000	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	--	---	---	---	---	---	---	6.6 U	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	71000	---	---	---	---	---	---	3.3 U	---	---	---	---	---
HEXACHLOROBUTADIENE	87-68-3	1200	9	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	40	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
METHYL BROMIDE	74-83-9	--	--	800	---	---	---	---	---	---	6.6 U	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	---	---	---	---	---	---	3.3 U	---	---	---	---	---
METHYLENE CHLORIDE	75-09-2	35000	210	45000	---	---	---	---	---	---	16.4 U	---	---	---	---	---
NAPHTHALENE	91-20-3	2000	160	54000	---	---	---	---	---	---	0.0033 U	---	---	---	---	---
N-BUTYL BENZENE	104-51-8	390000	--	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000	--	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000	--	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
STYRENE	100-42-5	600000	1200	13000	---	---	---	---	---	---	3.3 U	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000	--	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60	12000	---	---	---	---	---	---	3.3 U	---	---	---	---	---
TOLUENE	108-88-3	490000	10	190000	---	---	---	---	---	---	3.3 U	---	---	---	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	1100000	---	---	---	---	---	---	3.3 U	---	---	---	---	---

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Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	B-12-110502 (S-2)	CDW-1	CDW-2	CDW-3	CDW-5	SB106		SS-1A			SS-2A	
				SAMPLE ID	B-12-110502 (S-2)	MW-11-110502 (S-3)	MW-08-110502 (S-3)	MW-07-110502 (S-3)	MW-01-110502 (S-3)	SB-106A 0-5	SB-106A 3-5	SS-1A 0-1	SS-1A 1-2	SS-1A 1-2DUP	SS-2A 0-1	SS-2A 1-2
				SAMPLE DATE	05-Nov-02	05-Nov-02	05-Nov-02	05-Nov-02	05-Nov-02	21-Nov-11	21-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11
				QC IDENTIFIER									DUPLICATE	DUPLICATE		
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**												
VOCs (µg/kg)																
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	398	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60	13000	---	---	---	---	---	---	**28.4**	---	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
VINYL CHLORIDE	75-01-4	59	30	20	---	---	---	---	---	---	6.6 U	---	---	---	---	---
XYLENE O	95-47-6	65000	100	--	---	---	---	---	---	---	3.3 U	---	---	---	---	---
XYLENE P,M	179601-23-1	--	100	--	---	---	---	---	---	---	6.6 U	---	---	---	---	---
TOTAL XYLENES	1330-20-7	58000	--	110000	---	---	---	---	---	---	3.3 U	---	---	---	---	---
SVOC (µg/kg)		--	--	--												
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	96000	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	510000	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	80	430000	---	---	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	27000	---	---	---	---	---	---	---	---	---	---	---	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DICHLOROPHENOL	120-83-2	19000	10	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DINITROPHENOL	51-28-5	13000	61	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DINITROTOLUENE	121-14-2	1700	6000	900	---	---	---	---	---	---	---	---	---	---	---	---
2,6-DINITROTOLUENE	606-20-2	360	4000	--	---	---	---	---	---	---	---	---	---	---	---	---
2-CHLOROPHENOL	95-57-8	39000	60	--	---	---	---	---	---	---	---	---	---	---	---	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	--	---	---	---	---	---	---	---	---	---	---	---	---
2-NITROANILINE	88-74-4	63000	20	--	---	---	---	---	---	---	---	---	---	---	---	---
2-NITROPHENOL	88-75-5	--	1600	--	---	---	---	---	---	---	---	---	---	---	---	---
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	--	---	---	---	---	---	---	---	---	---	---	---	---
3-NITROANILINE	99-09-2	--	3160	--	---	---	---	---	---	---	---	---	---	---	---	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	--	---	---	---	---	---	---	---	---	---	---	---	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLORO-3-METHYLPHENOL	59-50-7	630000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROANILINE	106-47-8	2700	1000	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-NITROANILINE	100-01-6	25000	21900	--	---	---	---	---	---	---	---	---	---	---	---	---
4-NITROPHENOL	100-02-7		5120	--	---	---	---	---	---	---	---	---	---	---	---	---
BENZOIC ACID	65-85-0	25000000	10	--	---	---	---	---	---	---	---	---	---	---	---	---
BENZYL ALCOHOL	100-51-6	630000	2	--	---	---	---	---	---	---	---	---	---	---	---	---
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	--	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20	--	---	---	---	---	---	---	---	---	---	---	---	---
CARBAZOLE	86-74-8	--	70	--	---	---	---	---	---	---	---	---	---	---	---	---
CRESOLS, M- & P-		--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
DIBENZOFURAN	132-64-9	7300	150	--	---	---	---	---	---	---	---	---	---	---	---	---
DIETHYL PHTHALATE	84-66-2	5100000	250	--	---	---	---	---	---	---	---	---	---	---	---	---
DIMETHYL PHTHALATE	131-11-3	--	100000	--	---	---	---	---	---	---	---	---	---	---	---	---
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	--	---	---	---	---	---	---	---	---	---	---	---	---
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	--	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBENZENE	118-74-1	210	79	--	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROETHANE	67-72-1	1800	24	--	---	---	---	---	---	---	---	---	---	---	---	---
ISOPHORONE	78-59-1	570000	139000	--	---	---	---	---	---	---	---	---	---	---	---	---
NITROBENZENE	98-95-3	5100	2200	--	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	--	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	--	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	--	---	---	---	---	---	---	---	---	---	---	---	---
PENTACHLOROPHENOL	87-86-5	1000	2100	--	---	---	---	---	---	---	---	---	---	---	---	---
PHENOL	108-95-2	1900000	30000	--	---	---	---	---	---	---	---	---	---	---	---	---
PAHs (µg/kg)																
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	---	---	---	---	---	---	---	---	---	---	---	---
2-METHYLNAPHTHALENE	91-57-6	24000	110	123000	---	---	---	---	---	---	---	---	---	---	---	---
ACENAPHTHENE	83-32-9	360000	250	43000	---	---	---	---	---	---	---	---	---	---	---	---

Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	B-12-110502 (S-2)	CDW-1	CDW-2	CDW-3	CDW-5	SB106		SS-1A			SS-2A	
				SAMPLE ID	B-12-110502 (S-2)	MW-11-110502 (S-3)	MW-08-110502 (S-3)	MW-07-110502 (S-3)	MW-01-110502 (S-3)	SB-106A 0-5	SB-106A 3-5	SS-1A 0-1	SS-1A 1-2	SS-1A 1-2DUP	SS-2A 0-1	SS-2A 1-2
				SAMPLE DATE	05-Nov-02	05-Nov-02	05-Nov-02	05-Nov-02	05-Nov-02	21-Nov-11	21-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11
				QC IDENTIFIER									DUPLICATE	DUPLICATE		
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**												
PAHs (µg/kg)																
ACENAPHTHYLENE	208-96-8	360000	340	23000	---	---	---	---	---	---	---	---	---	---	---	---
ANTHRACENE	120-12-7	1800000	1.5	35000	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(A)ANTHRACENE	56-55-3	1100	1100	900	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(A)PYRENE	50-32-8	110	1100	400	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	900	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	800	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	900	---	---	---	---	---	---	---	---	---	---	---	---
CHRYSENE	218-01-9	110000	1100	400	---	---	---	---	---	---	---	---	---	---	---	---
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	400	---	---	---	---	---	---	---	---	---	---	---	---
FLUORANTHENE	206-44-0	240000	29000	20000	---	---	---	---	---	---	---	---	---	---	---	---
FLUORENE	86-73-7	240000	30000	28000	---	---	---	---	---	---	---	---	---	---	---	---
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	900	---	---	---	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	2000	160	54000	---	---	---	---	---	---	---	---	---	---	---	---
PHENANTHRENE	85-01-8	180000	29000	40000	---	---	---	---	---	---	---	---	---	---	---	---
PYRENE	129-00-0	180000	1100	13000	---	---	---	---	---	---	---	---	---	---	---	---
TPH (mg/kg)																
DIESEL FUEL/FUEL OIL #2	68476-30-2	--	--	--	57 U	63 U	61 U	62 U	55 U	---	---	---	---	---	---	---
GASOLINE	8006-61-9	--	--	--	57 U	63 U	61 U	62 U	55 U	---	---	---	---	---	---	---
KEROSENE	8008-20-6	--	--	--	57 U	**140**	**110**	62 U	**100**	---	---	---	---	---	---	---
MINERAL SPIRITS	8052-41-3	--	--	--	57 U	63 U	61 U	62 U	55 U	---	---	---	---	---	---	---
MOTOR OIL/HYDRAULIC OIL	55957-10-3	--	--	--	110 U	130 U	120 U	120 U	110 U	---	---	---	---	---	---	---
TOTAL PETROLEUM HYDROCARBONS		--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
VPH (µg/kg)																
C5-C8 ALIPHATICS (ADJUSTED)		52000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
C5-C8 ALIPHATICS (UNADJUSTED)		--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
C9-C10 AROMATICS		9700	--	--	---	---	---	---	---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS (ADJUSTED)		9600	--	--	---	---	---	---	---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS (UNADJUSTED)		--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
EPH (µg/kg)																
C11-C22 AROMATICS (ADJUSTED)		9700	--	--	---	---	---	---	---	---	---	---	---	---	---	---
C11-C22 AROMATICS (UNADJUSTED)		--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
C19-C36 ALIPHATICS		23000000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
C9-C18 ALIPHATICS		9600	--	--	---	---	---	---	---	---	---	---	---	---	---	---
PCBs (µg/kg)																
AROCLOR 1016	12674-11-2	410	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2	200	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5	170	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9	230	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6	230	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1	120	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5	240	20	--	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	120	20	10000	---	---	---	---	---	---	---	---	---	---	---	---
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700	--	--	---	---	---	---	---	---	---	---	---	---	---	---
ANTIMONY	7440-36-0	3.1	0.27	10	---	---	---	---	---	---	---	---	---	---	---	---
ARSENIC	7440-38-2	0.68	18	7	---	---	---	---	---	---	---	**3.9**	**5.8**	**---**	**3.6**	**3.3**
BARIUM	7440-39-3	1500	330	5500	---	---	---	---	---	---	---	**10.3**	**10.6**	**---**	**6.4**	**5.2**
BERYLLIUM	7440-41-7	16	10	0.4	---	---	---	---	---	---	---	---	---	---	---	---
CADMIUM	7440-43-9	7.1	0.36	39	---	---	---	---	---	---	---	**0.1 J**	0.5 U	**---**	0.5 U	0.5 U
CALCIUM	7440-70-2	EN	--	--	---	---	---	---	---	---	---	---	---	---	---	---
CHROMIUM	7440-47-3	12000	0.4	1400/390	---	---	---	---	---	---	---	**4.6**	**6.2**	**---**	**3.1**	**2.4**
COBALT	7440-48-4	2.3	2.4	--	---	---	---	---	---	---	---	---	---	---	---	---
COPPER	7440-50-8	310	28	3100	---	---	---	---	---	---	---	---	---	---	---	---
IRON	7439-89-6	5500	--	--	---	---	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	400	11	150	---	---	---	---	---	---	---	**22.6**	**20.1**	**---**	**16.7**	**6.4**
MAGNESIUM	7439-95-4	EN	--	--	---	---	---	---	---	---	---	---	---	---	---	---
MANGANESE	7439-96-5	180	220	390	---	---	---	---	---	---	---	---	---	---	---	---
MERCURY	7439-97-6	2.3	0.013	23	---	---	---	---	---	---	---	**0.049**	**0.032** J	**0.037**	0.036 U	0.035 U
NICKEL	7440-02-0	150	38	1000	---	---	---	---	---	---	---	---	---	---	---	---

Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	B-12-110502 (S-2)	CDW-1	CDW-2	CDW-3	CDW-5	SB106		SS-1A			SS-2A	
				SAMPLE ID	B-12-110502 (S-2)	MW-11-110502 (S-3)	MW-08-110502 (S-3)	MW-07-110502 (S-3)	MW-01-110502 (S-3)	SB-106A 0-5	SB-106A 3-5	SS-1A 0-1	SS-1A 1-2	SS-1A 1-2DUP	SS-2A 0-1	SS-2A 1-2
				SAMPLE DATE	05-Nov-02	05-Nov-02	05-Nov-02	05-Nov-02	05-Nov-02	21-Nov-11	21-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11
				QC IDENTIFIER									DUPLICATE	DUPLICATE		
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**												
METALS (mg/kg)																
POTASSIUM	7440-09-7	EN	--	--	---	---	---	---	---	---	---	---	---	---	---	---
SELENIUM	7782-49-2	39	0.52	390	---	---	---	---	---	---	---	5.1 U	5.0 U	---	5.3 U	5.0 U
SILVER	7440-22-4	39	4.2	200	---	---	---	---	---	---	---	0.5 U	0.5 U	---	0.5 U	0.5 U
SODIUM	7440-23-5	EN	--	--	---	---	---	---	---	---	---	---	---	---	---	---
THALLIUM	7440-28-0	0.078	0.22	5.5	---	---	---	---	---	---	---	---	---	---	---	---
VANADIUM	7440-62-2	39	2	550	---	---	---	---	---	---	---	---	---	---	---	---
ZINC	7440-66-6	2300	46	6000	---	---	---	---	---	---	---	---	---	---	---	---
TOC (mg/kg)																
TOTAL ORGANIC CARBON	TOC	--	--	--	---	---	---	---	---	**2100**	---	---	---	---	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 1997)
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

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Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SS-3A			SS-4A		SS-5A		SS-6A		SB-201	SB-202	
				SAMPLE ID	SS-3A 0-1	SS-3A 1-2	SS-3AD 1-2	SS-4A 0-1	SS-4A 1-2	SS-5A 0-1	SS-5A 1-2	SS-6A 0-1	SS-6A 1-2	SB-201-A 8-10	SB-202-A 8-10	SB-202-A 13-15
				SAMPLE DATE	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	18-Sep-13	18-Sep-13	18-Sep-13
				QC IDENTIFIER		DUPLICATE	DUPLICATE									
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**												
VOCs (µg/kg)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	2200	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	540000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	320	3600	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	140	920000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	40	200	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6	--	--	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	96000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	1230	10	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	400	900	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	280	1900	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	80	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7	--	--	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	1000	--	37.9 U	61.8 U	48.2 U	---	---	---	---	---	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000	--	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
2-HEXANONE	591-78-6	20000	360	--	37.9 U	61.8 U	48.2 U	---	---	---	---	---	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000	--	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	10	--	**3.3** J	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	--	37.9 U	61.8 U	48.2 U	---	---	---	---	---	---	---	---	---
ACETONE	67-64-1	6100000	40	7800000	39.9 U	61.8 U	48.2 U	---	---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	120	2500	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	50 U	40 U	50 U
BROMOBENZENE	108-86-1	29000	--	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000	--	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	540	10000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
BROMOFORM	75-25-2	19000	70	81000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	5	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	50	1500	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
CHLOROBENZENE	108-90-7	28000	2400	210000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
CHLOROETHANE	75-00-3	1400000	--	--	7.6 U	12.4 U	9.6 U	---	---	---	---	---	---	---	---	---
CHLOROFORM	67-66-3	320	50	1200	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
CHLOROMETHANE	74-87-3	11000	10400	--	7.6 U	12.4 U	9.6 U	---	---	---	---	---	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	630000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	398	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	65000	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	--	7.6 U	12.4 U	9.6 U	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	71000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	**4090 J**	**1040 J**	**320 J**
HEXACHLOROBUTADIENE	87-68-3	1200	9	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	40	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
METHYL BROMIDE	74-83-9	--	--	800	7.6 U	12.4 U	9.6 U	---	---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	50 U	40 U	50 U
METHYLENE CHLORIDE	75-09-2	35000	210	45000	18.9 U	30.9 U	24.1 U	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	2000	160	54000	0.0038 U	0.0062 U	0.0048 U	---	---	---	---	---	---	**3520 J**	**2530 J**	**790** J
N-BUTYL BENZENE	104-51-8	390000	--	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000	--	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000	--	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
STYRENE	100-42-5	600000	1200	13000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000	--	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60	12000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	490000	10	190000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	**440 J**	40 UJ	50 UJ
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	1100000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---

Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SS-3A			SS-4A		SS-5A		SS-6A		SB-201	SB-202	
				SAMPLE ID	SS-3A 0-1	SS-3A 1-2	SS-3AD 1-2	SS-4A 0-1	SS-4A 1-2	SS-5A 0-1	SS-5A 1-2	SS-6A 0-1	SS-6A 1-2	SB-201-A 8-10	SB-202-A 8-10	SB-202-A 13-15
				SAMPLE DATE	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	18-Sep-13	18-Sep-13	18-Sep-13
				QC IDENTIFIER		DUPLICATE	DUPLICATE									
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**												
VOCs (µg/kg)																
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	398	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60	13000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	---	---	---
VINYL CHLORIDE	75-01-4	59	30	20	7.6 U	12.4 U	9.6 U	---	---	---	---	---	---	---	---	---
XYLENE O	95-47-6	65000	100	--	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	**930 J**	**1250 J**	**230 J**
XYLENE P,M	179601-23-1	--	100	--	7.6 U	12.4 U	9.6 U	---	---	---	---	---	---	**160 J**	**120 J**	**150 J**
TOTAL XYLENES	1330-20-7	58000	--	110000	3.8 U	6.2 U	4.8 U	---	---	---	---	---	---	**1090 J**	**1370 J**	**380 J**
SVOC (µg/kg)		--	--	--												
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	96000	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	510000	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	80	430000	---	---	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	27000	---	---	---	---	---	---	---	---	---	---	---	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DICHLOROPHENOL	120-83-2	19000	10	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DINITROPHENOL	51-28-5	13000	61	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DINITROTOLUENE	121-14-2	1700	6000	900	---	---	---	---	---	---	---	---	---	---	---	---
2,6-DINITROTOLUENE	606-20-2	360	4000	--	---	---	---	---	---	---	---	---	---	---	---	---
2-CHLOROPHENOL	95-57-8	39000	60	--	---	---	---	---	---	---	---	---	---	---	---	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	--	---	---	---	---	---	---	---	---	---	---	---	---
2-NITROANILINE	88-74-4	63000	20	--	---	---	---	---	---	---	---	---	---	---	---	---
2-NITROPHENOL	88-75-5	--	1600	--	---	---	---	---	---	---	---	---	---	---	---	---
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	--	---	---	---	---	---	---	---	---	---	---	---	---
3-NITROANILINE	99-09-2	--	3160	--	---	---	---	---	---	---	---	---	---	---	---	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	--	---	---	---	---	---	---	---	---	---	---	---	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLORO-3-METHYLPHENOL	59-50-7	630000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROANILINE	106-47-8	2700	1000	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-NITROANILINE	100-01-6	25000	21900	--	---	---	---	---	---	---	---	---	---	---	---	---
4-NITROPHENOL	100-02-7		5120	--	---	---	---	---	---	---	---	---	---	---	---	---
BENZOIC ACID	65-85-0	25000000	10	--	---	---	---	---	---	---	---	---	---	---	---	---
BENZYL ALCOHOL	100-51-6	630000	2	--	---	---	---	---	---	---	---	---	---	---	---	---
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	--	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20	--	---	---	---	---	---	---	---	---	---	---	---	---
CARBAZOLE	86-74-8	--	70	--	---	---	---	---	---	---	---	---	---	---	---	---
CRESOLS, M- & P-		--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
DIBENZOFURAN	132-64-9	7300	150	--	---	---	---	---	---	---	---	---	---	---	---	---
DIETHYL PHTHALATE	84-66-2	5100000	250	--	---	---	---	---	---	---	---	---	---	---	---	---
DIMETHYL PHTHALATE	131-11-3	--	100000	--	---	---	---	---	---	---	---	---	---	---	---	---
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	--	---	---	---	---	---	---	---	---	---	---	---	---
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	--	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBENZENE	118-74-1	210	79	--	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROETHANE	67-72-1	1800	24	--	---	---	---	---	---	---	---	---	---	---	---	---
ISOPHORONE	78-59-1	570000	139000	--	---	---	---	---	---	---	---	---	---	---	---	---
NITROBENZENE	98-95-3	5100	2200	--	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	--	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	--	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	--	---	---	---	---	---	---	---	---	---	---	---	---
PENTACHLOROPHENOL	87-86-5	1000	2100	--	---	---	---	---	---	---	---	---	---	---	---	---
PHENOL	108-95-2	1900000	30000	--	---	---	---	---	---	---	---	---	---	---	---	---
PAHs (µg/kg)																
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	---	---	---	---	---	---	---	---	---	---	---	---
2-METHYLNAPHTHALENE	91-57-6	24000	110	123000	---	---	---	---	---	---	---	---	---	---	**1460**	**230**
ACENAPHTHENE	83-32-9	360000	250	43000	---	---	---	---	---	---	---	---	---	**130 J**	170 U	160 U

Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SS-3A			SS-4A		SS-5A		SS-6A		SB-201	SB-202	
				SAMPLE ID	SS-3A 0-1	SS-3A 1-2	SS-3AD 1-2	SS-4A 0-1	SS-4A 1-2	SS-5A 0-1	SS-5A 1-2	SS-6A 0-1	SS-6A 1-2	SB-201-A 8-10	SB-202-A 8-10	SB-202-A 13-15
				SAMPLE DATE	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	18-Sep-13	18-Sep-13	18-Sep-13
				QC IDENTIFIER		DUPLICATE	DUPLICATE									
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**												
PAHs (µg/kg)																
ACENAPHTHYLENE	208-96-8	360000	340	23000	---	---	---	---	---	---	---	---	---	170 U	170 U	160 U
ANTHRACENE	120-12-7	1800000	1.5	35000	---	---	---	---	---	---	---	---	---	170 U	170 U	160 U
BENZO(A)ANTHRACENE	56-55-3	1100	1100	900	---	---	---	---	---	---	---	---	---	170 U	170 U	160 U
BENZO(A)PYRENE	50-32-8	110	1100	400	---	---	---	---	---	---	---	---	---	170 U	170 U	160 U
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	900	---	---	---	---	---	---	---	---	---	170 U	170 U	160 U
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	800	---	---	---	---	---	---	---	---	---	170 U	170 U	160 U
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	900	---	---	---	---	---	---	---	---	---	170 U	170 U	160 U
CHRYSENE	218-01-9	110000	1100	400	---	---	---	---	---	---	---	---	---	170 U	170 U	160 U
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	400	---	---	---	---	---	---	---	---	---	170 U	170 U	160 U
FLUORANTHENE	206-44-0	240000	29000	20000	---	---	---	---	---	---	---	---	---	**100 J**	170 U	160 U
FLUORENE	86-73-7	240000	30000	28000	---	---	---	---	---	---	---	---	---	**90 J**	170 U	160 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	900	---	---	---	---	---	---	---	---	---	170 U	170 U	160 U
NAPHTHALENE	91-20-3	2000	160	54000	---	---	---	---	---	---	---	---	---	**280 J**	**130 J**	160 U
PHENANTHRENE	85-01-8	180000	29000	40000	---	---	---	---	---	---	---	---	---	**140 J**	170 U	160 U
PYRENE	129-00-0	180000	1100	13000	---	---	---	---	---	---	---	---	---	170 U	170 U	160 U
TPH (mg/kg)																
DIESEL FUEL/FUEL OIL #2	68476-30-2	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
GASOLINE	8006-61-9	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
KEROSENE	8008-20-6	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
MINERAL SPIRITS	8052-41-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
MOTOR OIL/HYDRAULIC OIL	55957-10-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL PETROLEUM HYDROCARBONS		--	--	--	---	---	---	---	---	---	---	---	---	**2430.9**	**2958.9**	**121.35**
VPH (µg/kg)																
C5-C8 ALIPHATICS (ADJUSTED)		52000	--	--	---	---	---	---	---	---	---	---	---	**153 J**	**14.0 J**	6.78 U
C5-C8 ALIPHATICS (UNADJUSTED)		--	--	--	---	---	---	---	---	---	---	---	---	**153 J**	**14.0 J**	6.78 U
C9-C10 AROMATICS		9700	--	--	---	---	---	---	---	---	---	---	---	**128 J**	**94.4 J**	**32.2 J**
C9-C12 ALIPHATICS (ADJUSTED)		9600	--	--	---	---	---	---	---	---	---	---	---	**259 J**	**217 J**	**82.2 J**
C9-C12 ALIPHATICS (UNADJUSTED)		--	--	--	---	---	---	---	---	---	---	---	---	**393 J**	**314 J**	**115 J**
EPH (µg/kg)																
C11-C22 AROMATICS (ADJUSTED)		9700	--	--	---	---	---	---	---	---	---	---	---	**214**	**175**	**11.5 J**
C11-C22 AROMATICS (UNADJUSTED)		--	--	--	---	---	---	---	---	---	---	---	---	**217**	**176**	**11.8 J**
C19-C36 ALIPHATICS		23000000	--	--	---	---	---	---	---	---	---	---	---	28.8 U	29 U	5.4 U
C9-C18 ALIPHATICS		9600	--	--	---	---	---	---	---	---	---	---	---	**1450 J**	**2270 J**	**51.3 J**
PCBs (µg/kg)																
AROCLOR 1016	12674-11-2	410	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2	200	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5	170	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9	230	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6	230	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1	120	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5	240	20	--	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	120	20	10000	---	---	---	---	---	---	---	---	---	---	---	---
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700	--	--	---	---	---	---	---	---	---	---	---	---	---	---
ANTIMONY	7440-36-0	3.1	0.27	10	---	---	---	---	---	---	---	---	---	---	---	---
ARSENIC	7440-38-2	0.68	18	7	**4.2**	**3.5**	**2.9**	**3.5**	**4.0**	**3.9**	**2.9**	**4.2**	**7.6**	---	---	---
BARIUM	7440-39-3	1500	330	5500	**6.8**	**6.7**	**6.6**	**10.1**	**8.9**	**14.6**	**16.0**	**9.5**	**11.6**	---	---	---
BERYLLIUM	7440-41-7	16	10	0.4	---	---	---	---	---	---	---	---	---	---	---	---
CADMIUM	7440-43-9	7.1	0.36	39	**0.07 J**	0.5 U	0.5 U	0.5 U	0.6 U	0.5 U	**0.1 J**	0.5 U	**0.09 J**	---	---	---
CALCIUM	7440-70-2	EN	--	--	---	---	---	---	---	---	---	---	---	---	---	---
CHROMIUM	7440-47-3	12000	0.4	1400/390	**4.7**	**2.9**	**2.6**	**5.0**	**4.1**	**3.1**	**5.1**	**4.0**	**7.0**	---	---	---
COBALT	7440-48-4	2.3	2.4	--	---	---	---	---	---	---	---	---	---	---	---	---
COPPER	7440-50-8	310	28	3100	---	---	---	---	---	---	---	---	---	---	---	---
IRON	7439-89-6	5500	--	--	---	---	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	400	11	150	**24.5**	**4.3 J**	**3.8 J**	**23.2**	**12.6**	**9.0**	**34.1**	**18.6**	**28.7**	---	---	---
MAGNESIUM	7439-95-4	EN	--	--	---	---	---	---	---	---	---	---	---	---	---	---
MANGANESE	7439-96-5	180	220	390	---	---	---	---	---	---	---	---	---	---	---	---
MERCURY	7439-97-6	2.3	0.013	23	**0.020** J	0.032 U	0.033 U	**0.029 J**	**0.014** J	0.031 U	**0.034**	0.033 U	0.037 U	---	---	---
NICKEL	7440-02-0	150	38	1000	---	---	---	---	---	---	---	---	---	---	---	---

Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SS-3A			SS-4A		SS-5A		SS-6A		SB-201	SB-202	
				SAMPLE ID	SS-3A 0-1	SS-3A 1-2	SS-3AD 1-2	SS-4A 0-1	SS-4A 1-2	SS-5A 0-1	SS-5A 1-2	SS-6A 0-1	SS-6A 1-2	SB-201-A 8-10	SB-202-A 8-10	SB-202-A 13-15
				SAMPLE DATE	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	18-Sep-13	18-Sep-13	18-Sep-13
				QC IDENTIFIER		DUPLICATE	DUPLICATE									
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**												
METALS (mg/kg)																
POTASSIUM	7440-09-7	EN	--	--	---	---	---	---	---	---	---	---	---	---	---	---
SELENIUM	7782-49-2	39	0.52	390	4.8 U	5.3 U	4.8 U	4.8 U	5.6 U	5.1 U	4.1 U	4.7 U	5.0 U	---	---	---
SILVER	7440-22-4	39	4.2	200	0.5 U	0.5 U	0.5 U	0.5 U	0.6 U	0.5 U	0.4 U	0.5 U	0.5 U	---	---	---
SODIUM	7440-23-5	EN	--	--	---	---	---	---	---	---	---	---	---	---	---	---
THALLIUM	7440-28-0	0.078	0.22	5.5	---	---	---	---	---	---	---	---	---	---	---	---
VANADIUM	7440-62-2	39	2	550	---	---	---	---	---	---	---	---	---	---	---	---
ZINC	7440-66-6	2300	46	6000	---	---	---	---	---	---	---	---	---	---	---	---
TOC (mg/kg)																
TOTAL ORGANIC CARBON	TOC	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 19
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

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Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-203	SB-204	SB-205	SB-206	SB-207	SB-208	SB-209	SB-210	SB-213	SB-214	SB-216	SB-217
				SAMPLE ID	SB-203-A 8-10	SB-204-A 8-10	SB-205-A 7-9	SB-206-A 8-10	SB-207-A 8-10	SB-208-A 8-10	SB-209-A 10-12	SB-210-A 8-10	SB-213-A 6-8	SB-214-A 6-8	SB-216-A 8-10	SB-217-A 8-10
				SAMPLE DATE	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**												
VOCs (µg/kg)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	2200	---	---	---	---	---	---	---	---	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	540000	---	---	---	---	---	---	---	---	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	--	---	---	---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	320	3600	---	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	140	920000	---	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	40	200	---	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	96000	---	---	---	---	---	---	---	---	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	1230	10	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	400	900	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	280	1900	---	---	---	---	---	---	---	---	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	--	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	80	--	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	--	---	---	---	---	---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	1000	--	---	---	---	---	---	---	---	---	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
2-HEXANONE	591-78-6	20000	360	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	10	--	---	---	---	---	---	---	---	---	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	--	---	---	---	---	---	---	---	---	---	---	---	---
ACETONE	67-64-1	6100000	40	7800000	---	---	---	---	---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	120	2500	40 U	40 U	50 U	**410 J**	470 U	50 U	**10 J**	**30 J**	40 U	40 U	40 U	50 U
BROMOBENZENE	108-86-1	29000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	540	10000	---	---	---	---	---	---	---	---	---	---	---	---
BROMOFORM	75-25-2	19000	70	81000	---	---	---	---	---	---	---	---	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	5	--	---	---	---	---	---	---	---	---	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	50	1500	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROBENZENE	108-90-7	28000	2400	210000	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROETHANE	75-00-3	1400000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROFORM	67-66-3	320	50	1200	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROMETHANE	74-87-3	11000	10400	--	---	---	---	---	---	---	---	---	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	630000	---	---	---	---	---	---	---	---	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	398	--	---	---	---	---	---	---	---	---	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	---	---	---	---	---	---	---	---	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	65000	--	---	---	---	---	---	---	---	---	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	--	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	71000	**3930 J**	**1070 J**	**1500.00 J**	**1770 J**	**150 J**	**290 J**	**3500 J**	**4210 J**	**80 J**	**4220 J**	**1970 J**	**990 J**
HEXACHLOROBUTADIENE	87-68-3	1200	9	--	---	---	---	---	---	---	---	---	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	40	--	---	---	---	---	---	---	---	---	---	---	---	---
METHYL BROMIDE	74-83-9	--	--	800	---	---	---	---	---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	40 U	400 U	50 U	80 U	47 U	50 U	40 U	40 U	40 U	40 U	40 U	50 U
METHYLENE CHLORIDE	75-09-2	35000	210	45000	---	---	---	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	2000	160	54000	**3190 J**	**6200 J**	**6860 J**	**1190 J**	**19800 J**	**1040 J**	**3170 J**	**13600 J**	**140 J**	**4100 J**	**6780 J**	**1530 J**
N-BUTYL BENZENE	104-51-8	390000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
STYRENE	100-42-5	600000	1200	13000	---	---	---	---	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60	12000	---	---	---	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	490000	10	190000	**20 J**	40 UJ	**20 J**	80 UJ	470 U	**330 J**	**30 J**	**50 J**	40 U	**20 J**	40 UJ	**20 J**
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	1100000	---	---	---	---	---	---	---	---	---	---	---	---

Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-203	SB-204	SB-205	SB-206	SB-207	SB-208	SB-209	SB-210	SB-213	SB-214	SB-216	SB-217
				SAMPLE ID	SB-203-A 8-10	SB-204-A 8-10	SB-205-A 7-9	SB-206-A 8-10	SB-207-A 8-10	SB-208-A 8-10	SB-209-A 10-12	SB-210-A 8-10	SB-213-A 6-8	SB-214-A 6-8	SB-216-A 8-10	SB-217-A 8-10
				SAMPLE DATE	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**												
VOCs (µg/kg)																
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	398	--	---	---	---	---	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60	13000	---	---	---	---	---	---	---	---	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	--	---	---	---	---	---	---	---	---	---	---	---	---
VINYL CHLORIDE	75-01-4	59	30	20	---	---	---	---	---	---	---	---	---	---	---	---
XYLENE O	95-47-6	65000	100	--	**570 J**	**400 J**	**120 J**	**350 J**	470 U	**100 J**	**410 J**	**480 J**	**20 J**	**400 J**	**1150 J**	**380 J**
XYLENE P,M	179601-23-1	--	100	--	**80 J**	**990 J**	**510 J**	**12700 J**	**780 J**	**170 J**	**140 J**	**4490 J**	**170 J**	**90 J**	**270 J**	**280 J**
TOTAL XYLENES	1330-20-7	58000	--	110000	**650 J**	**1390 J**	**630 J**	**13050 J**	**780 J**	**270 J**	**550 J**	**4970 J**	**190 J**	**490 J**	**1420 J**	**660 J**
SVOC (µg/kg)		--	--	--												
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	96000	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	510000	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	80	430000	---	---	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	27000	---	---	---	---	---	---	---	---	---	---	---	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DICHLOROPHENOL	120-83-2	19000	10	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DINITROPHENOL	51-28-5	13000	61	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DINITROTOLUENE	121-14-2	1700	6000	900	---	---	---	---	---	---	---	---	---	---	---	---
2,6-DINITROTOLUENE	606-20-2	360	4000	--	---	---	---	---	---	---	---	---	---	---	---	---
2-CHLOROPHENOL	95-57-8	39000	60	--	---	---	---	---	---	---	---	---	---	---	---	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	--	---	---	---	---	---	---	---	---	---	---	---	---
2-NITROANILINE	88-74-4	63000	20	--	---	---	---	---	---	---	---	---	---	---	---	---
2-NITROPHENOL	88-75-5	--	1600	--	---	---	---	---	---	---	---	---	---	---	---	---
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	--	---	---	---	---	---	---	---	---	---	---	---	---
3-NITROANILINE	99-09-2	--	3160	--	---	---	---	---	---	---	---	---	---	---	---	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	--	---	---	---	---	---	---	---	---	---	---	---	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLORO-3-METHYLPHENOL	59-50-7	630000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROANILINE	106-47-8	2700	1000	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-NITROANILINE	100-01-6	25000	21900	--	---	---	---	---	---	---	---	---	---	---	---	---
4-NITROPHENOL	100-02-7		5120	--	---	---	---	---	---	---	---	---	---	---	---	---
BENZOIC ACID	65-85-0	25000000	10	--	---	---	---	---	---	---	---	---	---	---	---	---
BENZYL ALCOHOL	100-51-6	630000	2	--	---	---	---	---	---	---	---	---	---	---	---	---
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	--	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20	--	---	---	---	---	---	---	---	---	---	---	---	---
CARBAZOLE	86-74-8	--	70	--	---	---	---	---	---	---	---	---	---	---	---	---
CRESOLS, M- & P-		--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
DIBENZOFURAN	132-64-9	7300	150	--	---	---	---	---	---	---	---	---	---	---	---	---
DIETHYL PHTHALATE	84-66-2	5100000	250	--	---	---	---	---	---	---	---	---	---	---	---	---
DIMETHYL PHTHALATE	131-11-3	--	100000	--	---	---	---	---	---	---	---	---	---	---	---	---
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	--	---	---	---	---	---	---	---	---	---	---	---	---
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	--	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBENZENE	118-74-1	210	79	--	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROETHANE	67-72-1	1800	24	--	---	---	---	---	---	---	---	---	---	---	---	---
ISOPHORONE	78-59-1	570000	139000	--	---	---	---	---	---	---	---	---	---	---	---	---
NITROBENZENE	98-95-3	5100	2200	--	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	--	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	--	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	--	---	---	---	---	---	---	---	---	---	---	---	---
PENTACHLOROPHENOL	87-86-5	1000	2100	--	---	---	---	---	---	---	---	---	---	---	---	---
PHENOL	108-95-2	1900000	30000	--	---	---	---	---	---	---	---	---	---	---	---	---
PAHs (µg/kg)																
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	---	---	---	---	---	---	---	---	---	---	---	---
2-METHYLNAPHTHALENE	91-57-6	24000	110	123000	**3960**	**2010**	**2740**	**560**	700 U	**920**	**1560**	**8820**	160 U	**3110**	**1990**	180 U
ACENAPHTHENE	83-32-9	360000	250	43000	**90 J**	180 U	190 U	190 U	700 U	160 U	170 U	**120 J**	160 U	**150 J**	160 U	180 U

Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-203	SB-204	SB-205	SB-206	SB-207	SB-208	SB-209	SB-210	SB-213	SB-214	SB-216	SB-217
				SAMPLE ID	SB-203-A 8-10	SB-204-A 8-10	SB-205-A 7-9	SB-206-A 8-10	SB-207-A 8-10	SB-208-A 8-10	SB-209-A 10-12	SB-210-A 8-10	SB-213-A 6-8	SB-214-A 6-8	SB-216-A 8-10	SB-217-A 8-10
				SAMPLE DATE	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**												
PAHs (µg/kg)																
ACENAPHTHYLENE	208-96-8	360000	340	23000	160 U	180 U	190 U	190 U	700 U	160 U	170 U	170 U	160 U	170 U	160 U	180 U
ANTHRACENE	120-12-7	1800000	1.5	35000	160 U	180 U	190 U	**170 J**	700 U	160 U	170 U	170 U	160 U	170 U	160 U	180 U
BENZO(A)ANTHRACENE	56-55-3	1100	1100	900	160 U	180 U	190 U	**660**	700 U	160 U	170 U	170 U	160 U	170 U	160 U	180 U
BENZO(A)PYRENE	50-32-8	110	1100	400	160 U	180 U	190 U	**640**	**860 J**	160 U	170 U	170 U	160 U	170 U	160 U	180 U
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	900	160 U	180 U	190 U	**810**	700 U	160 U	170 U	170 U	160 U	170 U	160 U	180 U
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	800	160 U	180 U	190 U	**230 J**	700 U	160 U	170 U	170 U	160 U	170 U	160 U	180 U
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	900	160 U	180 U	190 U	**270 J**	700 U	160 U	170 U	170 U	160 U	170 U	160 U	180 U
CHRYSENE	218-01-9	110000	1100	400	160 U	180 U	190 U	**650**	700 U	160 U	170 U	170 U	160 U	170 U	160 U	180 U
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	400	160 U	180 U	190 U	190 U	700 U	160 U	170 U	170 U	160 U	170 U	160 U	180 U
FLUORANTHENE	206-44-0	240000	29000	20000	160 U	180 U	190 U	**1160**	700 U	160 U	170 U	170 U	160 U	170 U	160 U	180 U
FLUORENE	86-73-7	240000	30000	28000	160 U	180 U	190 U	190 U	700 U	160 U	170 U	**110 J**	**120 J**	**120 J**	160 U	180 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	900	160 U	180 U	190 U	**280 J**	700 U	160 U	170 U	170 U	160 U	170 U	160 U	180 U
NAPHTHALENE	91-20-3	2000	160	54000	**240 J**	**700**	**1650**	**280 J**	**14800**	**740**	**760**	**4680**	160 U	**610**	**250** J	180 U
PHENANTHRENE	85-01-8	180000	29000	40000	160 U	180 U	190 U	**530 J**	700 U	160 U	170 U	170 U	**200 J**	170 U	160 U	180 U
PYRENE	129-00-0	180000	1100	13000	160 U	180 U	190 U	**1040**	700 U	160 U	**100 J**	170 U	**90 J**	170 U	160 U	180 U
TPH (mg/kg)																
DIESEL FUEL/FUEL OIL #2	68476-30-2	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
GASOLINE	8006-61-9	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
KEROSENE	8008-20-6	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
MINERAL SPIRITS	8052-41-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
MOTOR OIL/HYDRAULIC OIL	55957-10-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL PETROLEUM HYDROCARBONS		--	--	--	**1882.8**	**825.8**	**637.5**	**600.5**	**331.1**	**284.4**	**813.2**	**2449.5**	**670.89**	**2303.8**	**1585.2**	**605.4**
VPH (µg/kg)																
C5-C8 ALIPHATICS (ADJUSTED)		52000	--	--	**31.2 J**	**41.0 J**	**15.2 J**	**98.1 J**	70.2 U	**31.6**	**53.3 J**	**85.4 J**	6.5 U	**27.1 J**	**68.2 J**	**26.2**
C5-C8 ALIPHATICS (UNADJUSTED)		--	--	--	**31.2 J**	**41.0 J**	**15.2 J**	**98.5 J**	70.2 U	**31.9**	**53.4 J**	**85.5 J**	6.5 U	**27.1 J**	**68.2 J**	**26.2**
C9-C10 AROMATICS		9700	--	--	**154 J**	**96.9 J**	**60.0 J**	**46.3 J**	**23.9 J**	**11.2 J**	**79.5 J**	**142 J**	**3.93 J**	**128 J**	**200 J**	**58.1 J**
C9-C12 ALIPHATICS (ADJUSTED)		9600	--	--	**316 J**	**195 J**	**119 J**	**86.0 J**	70.2 U	**19.4 J**	**175 J**	**293 J**	**9.05 J**	**277 J**	**414 J**	**126 J**
C9-C12 ALIPHATICS (UNADJUSTED)		--	--	--	**474 J**	**294 J**	**181 J**	**147 J**	70.2 U	**31.2 J**	**259 J**	**444 J**	**13.3 J**	**410 J**	**618 J**	**186 J**
EPH (µg/kg)																
C11-C22 AROMATICS (ADJUSTED)		9700	--	--	**166**	**67.1**	**50.7**	**119**	**46.3 J**	**56.8**	**95.6**	**351**	**249**	**264**	**120**	**31.3**
C11-C22 AROMATICS (UNADJUSTED)		--	--	--	**171**	**69.8**	**55.1**	**126**	**62.0 J**	**58.5**	**98.0**	**365**	**249**	**268**	**122**	**31.3**
C19-C36 ALIPHATICS		23000000	--	--	28 U	**6.1 J**	6.5 U	**59.7**	**41.5 J**	**72.1**	**28.3**	**153**	**203**	29 U	5.5 U	6.0 U
C9-C18 ALIPHATICS		9600	--	--	**965 J**	**318 J**	**306 J**	**123 J**	**16.3 J**	**79.5 J**	**554 J**	**1260 J**	**193 J**	**1380 J**	**560 J**	**285 J**
PCBs (µg/kg)																
AROCLOR 1016	12674-11-2	410	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2	200	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5	170	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9	230	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6	230	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1	120	--	--	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5	240	20	--	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	120	20	10000	---	---	---	---	---	---	---	---	---	---	---	---
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700	--	--	---	---	---	---	---	---	---	---	---	---	---	---
ANTIMONY	7440-36-0	3.1	0.27	10	---	---	---	---	---	---	---	---	---	---	---	---
ARSENIC	7440-38-2	0.68	18	7	---	---	---	---	---	---	---	---	---	---	---	---
BARIUM	7440-39-3	1500	330	5500	---	---	---	---	---	---	---	---	---	---	---	---
BERYLLIUM	7440-41-7	16	10	0.4	---	---	---	---	---	---	---	---	---	---	---	---
CADMIUM	7440-43-9	7.1	0.36	39	---	---	---	---	---	---	---	---	---	---	---	---
CALCIUM	7440-70-2	EN	--	--	---	---	---	---	---	---	---	---	---	---	---	---
CHROMIUM	7440-47-3	12000	0.4	1400/390	---	---	---	---	---	---	---	---	---	---	---	---
COBALT	7440-48-4	2.3	2.4	--	---	---	---	---	---	---	---	---	---	---	---	---
COPPER	7440-50-8	310	28	3100	---	---	---	---	---	---	---	---	---	---	---	---
IRON	7439-89-6	5500	--	--	---	---	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	400	11	150	---	---	---	---	---	---	---	---	---	---	---	---
MAGNESIUM	7439-95-4	EN	--	--	---	---	---	---	---	---	---	---	---	---	---	---
MANGANESE	7439-96-5	180	220	390	---	---	---	---	---	---	---	---	---	---	---	---
MERCURY	7439-97-6	2.3	0.013	23	---	---	---	---	---	---	---	---	---	---	---	---
NICKEL	7440-02-0	150	38	1000	---	---	---	---	---	---	---	---	---	---	---	---

Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-203	SB-204	SB-205	SB-206	SB-207	SB-208	SB-209	SB-210	SB-213	SB-214	SB-216	SB-217
				SAMPLE ID	SB-203-A 8-10	SB-204-A 8-10	SB-205-A 7-9	SB-206-A 8-10	SB-207-A 8-10	SB-208-A 8-10	SB-209-A 10-12	SB-210-A 8-10	SB-213-A 6-8	SB-214-A 6-8	SB-216-A 8-10	SB-217-A 8-10
				SAMPLE DATE	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13	18-Sep-13
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**												
METALS (mg/kg)																
POTASSIUM	7440-09-7	EN	--	--	---	---	---	---	---	---	---	---	---	---	---	---
SELENIUM	7782-49-2	39	0.52	390	---	---	---	---	---	---	---	---	---	---	---	---
SILVER	7440-22-4	39	4.2	200	---	---	---	---	---	---	---	---	---	---	---	---
SODIUM	7440-23-5	EN	--	--	---	---	---	---	---	---	---	---	---	---	---	---
THALLIUM	7440-28-0	0.078	0.22	5.5	---	---	---	---	---	---	---	---	---	---	---	---
VANADIUM	7440-62-2	39	2	550	---	---	---	---	---	---	---	---	---	---	---	---
ZINC	7440-66-6	2300	46	6000	---	---	---	---	---	---	---	---	---	---	---	---
TOC (mg/kg)																
TOTAL ORGANIC CARBON	TOC	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 19
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

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Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-327	SB-328	SB-329	SB-330		SB-331	SB-332	SB-333	SB-334	SB-335	SB-336
				SAMPLE ID	SB-327-CI19-0-1	SB-328-CI19-0-1	SB-329-CI19-0-1	SB-330-CI19-0-1	SB-330-CI19-0-1-DUP	SB-331-CI19-0-1	SB-332-CI19-0-1	SB-333-CI19-0-1	SB-334-CI19-0-1	SB-335-CI19-0-1	SB-336-CI19-0-1
				SAMPLE DATE	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19
				QC IDENTIFIER				DUPLICATE	DUPLICATE						
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**											
VOCs (µg/kg)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	2200	---	---	---	---	---	---	---	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	540000	---	---	---	---	---	---	---	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	--	---	---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	320	3600	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	140	920000	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	40	200	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6	--	--	--	---	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	--	---	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	--	---	---	---	---	---	---	---	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	96000	---	---	---	---	---	---	---	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	--	---	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	--	---	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	1230	10	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	--	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	400	900	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	280	1900	---	---	---	---	---	---	---	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	--	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	80	--	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	---	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	--	---	---	---	---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7	--	--	--	---	---	---	---	---	---	---	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	1000	--	---	---	---	---	---	---	---	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000	--	--	---	---	---	---	---	---	---	---	---	---	---
2-HEXANONE	591-78-6	20000	360	--	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000	--	--	---	---	---	---	---	---	---	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	10	--	---	---	---	---	---	---	---	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	--	---	---	---	---	---	---	---	---	---	---	---
ACETONE	67-64-1	6100000	40	7800000	---	---	---	---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	120	2500	---	---	---	---	---	---	---	---	---	---	---
BROMOBENZENE	108-86-1	29000	--	--	---	---	---	---	---	---	---	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000	--	--	---	---	---	---	---	---	---	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	540	10000	---	---	---	---	---	---	---	---	---	---	---
BROMOFORM	75-25-2	19000	70	81000	---	---	---	---	---	---	---	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	5	--	---	---	---	---	---	---	---	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	50	1500	---	---	---	---	---	---	---	---	---	---	---
CHLOROBENZENE	108-90-7	28000	2400	210000	---	---	---	---	---	---	---	---	---	---	---
CHLOROETHANE	75-00-3	1400000	--	--	---	---	---	---	---	---	---	---	---	---	---
CHLOROFORM	67-66-3	320	50	1200	---	---	---	---	---	---	---	---	---	---	---
CHLOROMETHANE	74-87-3	11000	10400	--	---	---	---	---	---	---	---	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	630000	---	---	---	---	---	---	---	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	398	--	---	---	---	---	---	---	---	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	---	---	---	---	---	---	---	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	65000	--	---	---	---	---	---	---	---	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	--	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	71000	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBUTADIENE	87-68-3	1200	9	--	---	---	---	---	---	---	---	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	40	--	---	---	---	---	---	---	---	---	---	---	---
METHYL BROMIDE	74-83-9	--	--	800	---	---	---	---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	---	---	---	---	---	---	---	---	---	---	---
METHYLENE CHLORIDE	75-09-2	35000	210	45000	---	---	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	2000	160	54000	---	---	---	---	---	---	---	---	---	---	---
N-BUTYL BENZENE	104-51-8	390000	--	--	---	---	---	---	---	---	---	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000	--	--	---	---	---	---	---	---	---	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000	--	--	---	---	---	---	---	---	---	---	---	---	---
STYRENE	100-42-5	600000	1200	13000	---	---	---	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000	--	--	---	---	---	---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60	12000	---	---	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	490000	10	190000	---	---	---	---	---	---	---	---	---	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	1100000	---	---	---	---	---	---	---	---	---	---	---

Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-327	SB-328	SB-329	SB-330		SB-331	SB-332	SB-333	SB-334	SB-335	SB-336
				SAMPLE ID	SB-327-CI19-0-1	SB-328-CI19-0-1	SB-329-CI19-0-1	SB-330-CI19-0-1	SB-330-CI19-0-1-DUP	SB-331-CI19-0-1	SB-332-CI19-0-1	SB-333-CI19-0-1	SB-334-CI19-0-1	SB-335-CI19-0-1	SB-336-CI19-0-1
				SAMPLE DATE	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19
				QC IDENTIFIER				DUPLICATE	DUPLICATE						
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**											
VOCs (µg/kg)															
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	398	--	---	---	---	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60	13000	---	---	---	---	---	---	---	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	--	---	---	---	---	---	---	---	---	---	---	---
VINYL CHLORIDE	75-01-4	59	30	20	---	---	---	---	---	---	---	---	---	---	---
XYLENE O	95-47-6	65000	100	--	---	---	---	---	---	---	---	---	---	---	---
XYLENE P,M	179601-23-1	--	100	--	---	---	---	---	---	---	---	---	---	---	---
TOTAL XYLENES	1330-20-7	58000	--	110000	---	---	---	---	---	---	---	---	---	---	---
SVOC (µg/kg)		--	--	--											
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	96000	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
1,2-DICHLOROBENZENE	95-50-1	180000	90	510000	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
1,3-DICHLOROBENZENE	541-73-1	--	80	430000	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
1,4-DICHLOROBENZENE	106-46-7	2600	880	27000	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000	--	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	--	580 U	590 U	680 U	620 U	600 U	570 U	600 U	600 U	600 U	610 U	620 U
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
2,4-DICHLOROPHENOL	120-83-2	19000	10	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	--	230 UJ	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
2,4-DINITROPHENOL	51-28-5	13000	61	--	580 U	590 U	680 U	620 U	600 U	570 U	600 U	600 U	600 U	610 U	620 U
2,4-DINITROTOLUENE	121-14-2	1700	6000	900	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
2,6-DINITROTOLUENE	606-20-2	360	4000	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
2-CHLOROPHENOL	95-57-8	39000	60	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
2-NITROANILINE	88-74-4	63000	20	--	580 U	590 U	680 U	620 U	600 U	570 U	600 U	600 U	600 U	610 U	620 U
2-NITROPHENOL	88-75-5	--	1600	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
3-NITROANILINE	99-09-2	--	3160	--	580 U	590 U	680 U	620 U	600 U	570 U	600 U	600 U	600 U	610 U	620 U
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	--	580 U	590 U	680 U	620 U	600 U	570 U	600 U	600 U	600 U	610 U	620 U
4-BROMOPHENYL PHENYL ETHER	101-55-3	--	--	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
4-CHLORO-3-METHYLPHENOL	59-50-7	630000	--	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
4-CHLOROANILINE	106-47-8	2700	1000	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	--	--	--	230 UJ	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
4-NITROANILINE	100-01-6	25000	21900	--	580 UJ	590 U	680 U	620 U	600 U	570 U	600 U	600 U	600 U	610 U	620 U
4-NITROPHENOL	100-02-7		5120	--	580 U	590 U	680 U	620 U	600 U	570 U	600 U	600 U	600 U	610 U	620 U
BENZOIC ACID	65-85-0	25000000	10	--	580 UJ	590 UJ	680 UJ	620 UJ	600 UJ	570 UJ	600 UJ	600 UJ	600 UJ	610 UJ	620 UJ
BENZYL ALCOHOL	100-51-6	630000	2	--	470 UJ	480 U	550 U	500 U	490 U	460 U	480 U	490 U	480 U	490 U	500 U
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000	--	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230	--	--	230 UJ	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	20	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
CARBAZOLE	86-74-8	--	70	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
CRESOLS, M- & P-		--	--	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
DIBENZOFURAN	132-64-9	7300	150	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
DIETHYL PHTHALATE	84-66-2	5100000	250	--	230 UJ	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
DIMETHYL PHTHALATE	131-11-3	--	100000	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
HEXACHLOROBENZENE	118-74-1	210	79	--	230 UJ	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
HEXACHLOROETHANE	67-72-1	1800	24	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
ISOPHORONE	78-59-1	570000	139000	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
NITROBENZENE	98-95-3	5100	2200	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
PENTACHLOROPHENOL	87-86-5	1000	2100	--	580 U	590 U	680 U	620 U	600 U	570 U	600 U	600 U	600 U	610 U	620 U
PHENOL	108-95-2	1900000	30000	--	230 U	240 U	280 U	250 U	240 U	230 U	240 U	240 U	240 U	250 U	250 U
PAHs (µg/kg)															
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	9.4 UJ	**2.6 J**	11 U	**34**	**28**	**12 J**	**4.4 J**	**2.5 J**	9.8 UJ	10 UJ	10 UJ
2-METHYLNAPHTHALENE	91-57-6	24000	110	123000	9.4 UJ	**4.4 J**	**29**	**74**	**56**	**22**	**8.1 J**	**3.5 J**	9.8 UJ	10 UJ	10 UJ
ACENAPHTHENE	83-32-9	360000	250	43000	9.4 UJ	9.7 U	11 U	**9.4 J**	**4.6 J**	**13 J**	9.7 UJ	9.8 UJ	9.8 UJ	10 UJ	10 UJ

Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-327	SB-328	SB-329	SB-330		SB-331	SB-332	SB-333	SB-334	SB-335	SB-336
				SAMPLE ID	SB-327-CI19-0-1	SB-328-CI19-0-1	SB-329-CI19-0-1	SB-330-CI19-0-1	SB-330-CI19-0-1-DUP	SB-331-CI19-0-1	SB-332-CI19-0-1	SB-333-CI19-0-1	SB-334-CI19-0-1	SB-335-CI19-0-1	SB-336-CI19-0-1
				SAMPLE DATE	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19
				QC IDENTIFIER				DUPLICATE	DUPLICATE						
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**											
PAHs (µg/kg)															
ACENAPHTHYLENE	208-96-8	360000	340	23000	9.4 UJ	9.7 U	11 U	**150 J**	**55 J**	**29**	**9.8 J**	9.8 UJ	9.8 UJ	10 UJ	10 UJ
ANTHRACENE	120-12-7	1800000	1.5	35000	9.4 UJ	**4.5 J**	**6.3 J**	**490 J**	**62 J**	**59 J**	**11 J**	**3.1 J**	9.8 UJ	10 UJ	10 UJ
BENZO(A)ANTHRACENE	56-55-3	1100	1100	900	**4.6 J**	**48**	**47**	**3500**	**710**	**380**	**95 J**	**21 J**	**9.2 J**	**5.9 J**	**6.3 J**
BENZO(A)PYRENE	50-32-8	110	1100	400	**7.3 J**	**59 J**	**66 J**	**3300 J**	**880 J**	**580 J**	**150 J**	**29 J**	**12 J**	**8.7 J**	**11 J**
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	900	**9.5 J**	**81**	**86**	**3400**	**950**	**630 J**	**140 J**	**46 J**	**23 J**	**17 J**	**18 J**
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	800	**18 J**	**42**	**67**	**1800 J**	**530**	**360**	**120 J**	**28 J**	**10 J**	**7.6 J**	**8.4 J**
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	900	**5.1 J**	**28**	**32**	**1200 J**	**250**	**200**	**63 J**	**18 J**	**9.2 J**	**7.3 J**	**7.8 J**
CHRYSENE	218-01-9	110000	1100	400	**7.4 J**	**62**	**60**	**2400**	**660**	**420**	**130 J**	**31 J**	**13 J**	**8.8 J**	**9.0 J**
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	400	9.4 UJ	**12 J**	**18 J**	**280 J**	**130 J**	**93**	**32 J**	**9.0 J**	**3.2 J**	10 **UJ**	10 **UJ**
FLUORANTHENE	206-44-0	240000	29000	20000	**3.1 J**	**67**	**64**	**5000 J**	**480 J**	**520 J**	**86 J**	**37 J**	**16 J**	**12 J**	**14 J**
FLUORENE	86-73-7	240000	30000	28000	9.4 UJ	9.7 U	11 U	**94 J**	**24 J**	**25**	**4.9 J**	9.8 UJ	9.8 UJ	10 UJ	10 UJ
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	900	**4.7 J**	**45**	**73**	**1900 J**	**480**	**320**	**92 J**	**21 J**	**8.8 J**	**6.7 J**	**5.3 J**
NAPHTHALENE	91-20-3	2000	160	54000	9.4 UJ	9.7 U	**23**	**110**	**77**	**31**	**13 J**	9.8 UJ	9.8 UJ	10 UJ	10 UJ
PHENANTHRENE	85-01-8	180000	29000	40000	**2.1 J**	**39**	**40**	**1300 J**	**390**	**400**	**77 J**	**28 J**	**8 J**	**5.2 J**	**6.8 J**
PYRENE	129-00-0	180000	1100	13000	**3.7 J**	**77**	**67**	**6600 J**	**1100 J**	**1200 J**	**380 J**	**51 J**	**10 J**	**6.5 J**	**12 J**
TPH (mg/kg)															
DIESEL FUEL/FUEL OIL #2	68476-30-2	--	--	--	---	---	---	---	---	---	---	---	---	---	---
GASOLINE	8006-61-9	--	--	--	---	---	---	---	---	---	---	---	---	---	---
KEROSENE	8008-20-6	--	--	--	---	---	---	---	---	---	---	---	---	---	---
MINERAL SPIRITS	8052-41-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---
MOTOR OIL/HYDRAULIC OIL	55957-10-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---
TOTAL PETROLEUM HYDROCARBONS		--	--	--	---	---	---	---	---	---	---	---	---	---	---
VPH (µg/kg)															
C5-C8 ALIPHATICS (ADJUSTED)		52000	--	--	---	---	---	---	---	---	---	---	---	---	---
C5-C8 ALIPHATICS (UNADJUSTED)		--	--	--	---	---	---	---	---	---	---	---	---	---	---
C9-C10 AROMATICS		9700	--	--	---	---	---	---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS (ADJUSTED)		9600	--	--	---	---	---	---	---	---	---	---	---	---	---
C9-C12 ALIPHATICS (UNADJUSTED)		--	--	--	---	---	---	---	---	---	---	---	---	---	---
EPH (µg/kg)															
C11-C22 AROMATICS (ADJUSTED)		9700	--	--	---	---	---	---	---	---	---	---	---	---	---
C11-C22 AROMATICS (UNADJUSTED)		--	--	--	---	---	---	---	---	---	---	---	---	---	---
C19-C36 ALIPHATICS		23000000	--	--	---	---	---	---	---	---	---	---	---	---	---
C9-C18 ALIPHATICS		9600	--	--	---	---	---	---	---	---	---	---	---	---	---
PCBs (µg/kg)															
AROCLOR 1016	12674-11-2	410	--	--	8.6 U	9.6 U	9.0 U	8.8 U	8.1 U	8.7 U	8.7 U	8.2 U	8.4 U	---	8.5 U
AROCLOR 1221	11104-28-2	200	--	--	8.6 U	9.6 U	9.0 U	8.8 U	8.1 U	8.7 U	8.7 U	8.2 U	8.4 U	---	8.5 U
AROCLOR 1232	11141-16-5	170	--	--	10 U	11 U	11 U	10 U	9.5 U	10 U	10 U	9.7 U	9.9 U	---	10 U
AROCLOR 1242	53469-21-9	230	--	--	8.6 U	9.6 U	9.0 U	8.8 U	8.1 U	8.7 U	8.7 U	8.2 U	8.4 U	---	8.5 U
AROCLOR 1248	12672-29-6	230	--	--	8.6 U	9.6 U	9.0 U	8.8 U	8.1 U	8.7 U	8.7 U	8.2 U	8.4 U	---	8.5 U
AROCLOR 1254	11097-69-1	120	--	--	8.6 U	9.6 U	9.0 U	8.8 U	8.1 U	8.7 U	8.7 U	8.2 U	8.4 U	---	8.5 U
AROCLOR 1260	11096-82-5	240	20	--	8.6 U	9.6 U	**190**	8.8 U	8.1 U	**80**	8.7 U	**56**	8.4 U	---	8.5 U
TOTAL PCBS	1336-36-3	120	20	10000	61 U	68 U	**190**	63 U	58 U	**80 J**	62 U	**56 J**	60 U	---	61 U
METALS (mg/kg)															
ALUMINUM	7429-90-5	7700	--	--	**4400**	**6060**	**6640**	**5450**	**4630**	**5460**	**5790**	**4270**	**4920**	**5090**	**2660**
ANTIMONY	7440-36-0	3.1	0.27	10	**0.038 J**	**0.076**	**0.11**	**0.055**	**0.030 J**	**0.11**	**0.055 J**	**0.158**	**0.052 J**	**0.032 J**	**0.029 J**
ARSENIC	7440-38-2	0.68	18	7	**1.27**	**2.00**	**2.57**	**1.62**	**1.30**	**1.66**	**2.02**	**1.43**	**1.68**	**1.30**	**0.99**
BARIUM	7440-39-3	1500	330	5500	**14.5**	**17.6**	**18.6**	**23.5**	**22.0**	**32.4**	**18.1**	**9.92**	**11.3**	**8.22**	**4.27**
BERYLLIUM	7440-41-7	16	10	0.4	**0.350**	**0.438**	**0.502**	**0.282**	**0.280**	**0.344**	**0.629**	**0.397**	**0.386**	**0.381**	**0.260**
CADMIUM	7440-43-9	7.1	0.36	39	**0.0849**	**0.141**	**0.221**	**0.062**	**0.058 J**	**0.146**	**0.0845 J**	**0.293**	**0.058 J**	**0.085 J**	**0.027 J**
CALCIUM	7440-70-2	EN	--	--	**636**	**976**	**1100**	**1120**	**1360**	**933**	**691**	**335**	**414**	**358**	**353**
CHROMIUM	7440-47-3	12000	0.4	1400/390	**5.0**	**6.1**	**13.6**	**5.9**	**5.0**	**5.5**	**6.4**	**6.8**	**4.4**	**4.1**	**2.6**
COBALT	7440-48-4	2.3	2.4	--	**2.26**	**2.37**	**4.15**	**2.51**	**2.56**	**3.36**	**3.27**	**2.69**	**1.83**	**1.49**	**1.52**
COPPER	7440-50-8	310	28	3100	**6.82 J**	**9.96**	**10.7**	**6.89**	**6.30**	**9.18**	**9.14**	**9.41**	**4.66**	**3.69**	**2.82**
IRON	7439-89-6	5500	--	--	**6480**	**7740**	**10900**	**6700**	**6250**	**9070**	**9340**	**7560**	**6460**	**5930**	**4480**
LEAD	7439-92-1	400	11	150	**16.7 J**	**24.3**	**28.3**	**18.5**	**16.8**	**28.8**	**21.1**	**37.8**	**11.8**	**13.2**	**11.5**
MAGNESIUM	7439-95-4	EN	--	--	**1140**	**1120**	**4370**	**1420**	**1250**	**1460**	**1600**	**896**	**690**	**634**	**500**
MANGANESE	7439-96-5	180	220	390	**94.1 J**	**109**	**123**	**126**	**120**	**197**	**115**	**90.7**	**80.4**	**60.9**	**64.1**
MERCURY	7439-97-6	2.3	0.013	23	**0.0095 J**	**0.032 J**	**0.028 J**	**0.014 J**	**0.015 J**	**0.03 J**	**0.026 J**	**0.027 J**	**0.016 J**	**0.021 J**	**0.0091 J**
NICKEL	7440-02-0	150	38	1000	**4.15**	**4.94**	**22.5**	**3.92**	**3.48**	**4.70**	**6.11**	**4.94**	**3.41**	**3.36**	**2.26**

Table 5-3
Summary of Soil Analytical Data - Off-Project Walking Path/Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-327	SB-328	SB-329	SB-330		SB-331	SB-332	SB-333	SB-334	SB-335	SB-336
				SAMPLE ID	SB-327-CI19-0-1	SB-328-CI19-0-1	SB-329-CI19-0-1	SB-330-CI19-0-1	SB-330-CI19-0-1-DUP	SB-331-CI19-0-1	SB-332-CI19-0-1	SB-333-CI19-0-1	SB-334-CI19-0-1	SB-335-CI19-0-1	SB-336-CI19-0-1
				SAMPLE DATE	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19
				QC IDENTIFIER				DUPLICATE	DUPLICATE						
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res**											
METALS (mg/kg)															
POTASSIUM	7440-09-7	EN	--	--	**659**	**517**	**589**	**1040**	**979**	**1660**	**767**	**345**	**422**	**242**	**244**
SELENIUM	7782-49-2	39	0.52	390	**0.081 J**	**0.19 J**	**0.20 J**	**0.12 J**	**0.096 J**	**0.11 J**	**0.13 J**	**0.13 J**	**0.12 J**	**0.12 J**	**0.072 J**
SILVER	7440-22-4	39	4.2	200	**0.031 J**	**0.047 J**	**0.0729 J**	**0.025 J**	**0.029 J**	**0.184**	**0.046 J**	**0.0592 J**	**0.033 J**	**0.022 J**	**0.0462 J**
SODIUM	7440-23-5	EN	--	--	62 U	75 U	88 U	99 U	86 U	80 U	90 U	64 U	81 U	95 U	60 U
THALLIUM	7440-28-0	0.078	0.22	5.5	0.062 U	**0.0891**	**0.0961**	**0.099**	0.086 U	**0.11**	0.09 U	0.064 U	**0.065 J**	0.095 U	0.06 U
VANADIUM	7440-62-2	39	2	550	**7.26**	**10.8**	**12.3**	**10.3**	**8.72**	**10.3**	**14.7**	**8.31**	**7.53**	**6.79**	**5.55**
ZINC	7440-66-6	2300	46	6000	**34.0 J**	**41.1**	**92.3**	**28.0**	**26.8**	**90.0**	**37.6**	**38.0**	**22.9**	**18.8**	**15.4**
TOC (mg/kg)															
TOTAL ORGANIC CARBON	TOC	--	--	--	**11000 J**	---	---	**9900**	**7400**	---	---	---	**14000**	---	**10000**

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 19
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

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Table 5-4
Summary of Soil Analytical Data - Off-Site Background
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-401			SB-402		SB-403		SB-404		SB-405	
				SAMPLE ID	SB-401-CI20-0-1	SB-401-CI20-0-1-DUP	SB-401-CI20-1-3	SB-402-CI20-0-1	SB-402-CI20-1-3	SB-403-CI20-0-1	SB-403-CI20-1-3	SB-404-CI20-0-1	SB-404-CI20-1-3	SB-405-CI20-0-1	SB-405-CI20-1-3
				SAMPLE DATE	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20
				QC IDENTIFIER	DUPLICATE	DUPLICATE									
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**											
METALS (mg/kg)															
ALUMINUM	7429-90-5	7700	--	--	**9370**	**9930**	**9140**	**9700**	**7370**	**10300**	**10400**	**9140**	**9710**	**7470**	**10600**
ANTIMONY	7440-36-0	3.1	0.27	10	**0.051 J**	**0.05 J**	0.051 U	**0.042 J**	**0.024 J**	**0.061 J**	**0.037 J**	**0.076 J**	**0.05 J**	**0.045 J**	**0.016 J**
ARSENIC	7440-38-2	0.68	18	7	**2.92**	**2.64**	**1.97**	**2.53**	**2.02**	**2.93**	**3.43**	**2.88**	**4.03**	**2.3**	**2.37**
BARIUM	7440-39-3	1500	330	5500	**20.9**	**18.4**	**23.1**	**33.4**	**21.7**	**18.7**	**24.2**	**12.9**	**38.8**	**11.7**	**67.3**
BERYLLIUM	7440-41-7	16	10	0.4	**0.634**	**0.538**	**0.54**	**0.575**	**0.489**	**2.11**	**0.555**	**0.441**	**0.621**	**0.369**	**0.553**
CADMIUM	7440-43-9	7.1	0.36	39	**0.039 J**	**0.05 J**	**0.028 J**	**0.043 J**	**0.037 J**	**0.057 J**	**0.05 J**	**0.031 J**	**0.047 J**	**0.0513 J**	**0.04 J**
CALCIUM	7440-70-2	EN	--	--	**477**	**506**	**560**	**683**	**583**	**389**	**591**	**385**	**1190**	**319**	**1120**
CHROMIUM	7440-47-3	12000	0.4	1400/390	**11.8**	**11**	**10.9**	**11.7**	**9.64**	**10.5**	**12.3**	**9.39**	**15.3**	**7.36**	**19.6**
COBALT	7440-48-4	2.3	2.4	--	**5.12**	**3.77**	**7.37**	**6.32**	**6.32**	**3.21**	**5.12**	**3.59**	**6.79**	**2.85**	**7.19**
COPPER	7440-50-8	310	28	3100	**9.08**	**7.06**	**11.9**	**10.7**	**11.9**	**6.53**	**8.86**	**4.93**	**12.4**	**4.71**	**5.41**
IRON	7439-89-6	5500	--	--	**13800**	**14300**	**16700**	**15900**	**13700**	**17600**	**15800**	**10900**	**19700**	**9410**	**15800**
LEAD	7439-92-1	400	11	150	**13.3**	**15.7**	**8.76**	**13.5**	**8.27**	**20.4**	**7.62**	**6.44**	**10.4**	**11.2**	**7.51**
MAGNESIUM	7439-95-4	EN	--	--	**2610**	**2300**	**3910**	**3310**	**3120**	**1560**	**2820**	**1540**	**3670**	**1340**	**4530**
MANGANESE	7439-96-5	180	220	390	**156**	**146**	**218**	**196**	**185**	**122**	**154**	**99.8**	**217**	**85.9**	**199**
MERCURY	7439-97-6	2.3	0.013	23	**0.022 J**	**0.035 J**	**0.013 J**	**0.024 J**	**0.017 J**	**0.037**	**0.033**	**0.031 J**	**0.019 J**	**0.029 J**	**0.026 J**
NICKEL	7440-02-0	150	38	1000	**9.03**	**7.87**	**10.1**	**10.7**	**9.61**	**8.28**	**9.34**	**6.18**	**12.1**	**5.14**	**15.2**
POTASSIUM	7440-09-7	EN	--	--	**764 J**	**535 J**	**1060**	**1700**	**1100**	**514**	**937**	**428**	**1550**	**379**	**2600**
SELENIUM	7782-49-2	39	0.52	390	**0.18 J**	**0.28 J**	**0.073 J**	**0.16 J**	**0.063 J**	**0.43 J**	**0.2 J**	**0.21 J**	**0.14 J**	**0.19 J**	**0.062 J**
SILVER	7440-22-4	39	4.2	200	**0.028 J**	**0.032 J**	**0.011 J**	**0.027 J**	**0.011 J**	**0.062 J**	**0.023 J**	**0.033 J**	**0.022 J**	**0.037 J**	**0.0091 J**
SODIUM	7440-23-5	EN	--	--	100 U	110 U	100 U	100 U	84 U	110 U	90 U	99 U	100 U	63 U	82 U
THALLIUM	7440-28-0	0.078	0.22	5.5	**0.129**	**0.094 J**	**0.139**	**0.181**	**0.147**	**0.114**	**0.127**	**0.071 J**	**0.166**	**0.0891**	**0.167**
VANADIUM	7440-62-2	39	2	550	**18.5**	**17.6**	**15.1**	**17.2**	**13.1**	**17.4**	**19.7**	**14.4**	**23.5**	**11.6**	**26.7**
ZINC	7440-66-6	2300	46	6000	**30.5**	**28.4**	**35**	**31.2**	**26**	**27.2**	**28.7**	**18.6**	**30**	**17.5**	**28.5**
PAHs (µg/kg)															
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	11 U	11 U	10 U	11 U	10 U	11 U	9.8 U	11 U	11 U	11 U	11 U
2-METHYLNAPHTHALENE	91-57-6	24000	110	--	11 U	11 U	10 U	11 U	10 U	11 U	9.8 U	11 U	11 U	11 U	11 U
ACENAPHTHENE	83-32-9	360000	250	--	11 U	11 U	10 U	11 U	10 U	11 U	9.8 U	11 U	11 U	11 U	11 U
ACENAPHTHYLENE	208-96-8	--	340	--	**2.1 J**	11 U	10 U	11 U	10 U	11 U	9.8 U	11 U	11 U	11 U	11 U
ANTHRACENE	120-12-7	1800000	1.5	--	**2.7 J**	**4.9 J**	10 U	**1.8 J**	10 U	11 U	9.8 U	11 U	11 U	11 U	11 U
BENZO(A)ANTHRACENE	56-55-3	1100	1100	--	**17 J**	**22**	10 U	**16 J**	10 U	**5.7 J**	9.8 U	**3.1 J**	11 U	**4.8 J**	11 U
BENZO(A)PYRENE	50-32-8	110	1100	--	**18 J**	**25 J**	**10 UJ**	**18 J**	**10 UJ**	**6.7 J**	9.8 U	**11 UJ**	**11 UJ**	**5.8 J**	**11 UJ**
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	--	**34**	**40**	10 U	**31**	10 U	**10 J**	9.8 U	**5.6 J**	11 U	**9.5 J**	11 U
BENZO(G,H,I)PERYLENE	191-24-2	180000	1100	--	**16 J**	**15 J**	10 U	**11 J**	10 U	**4.4 J**	9.8 U	**3.6 J**	11 U	**6.8 J**	11 U
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	--	**14 J**	**17 J**	10 U	**12 J**	10 U	**5.1 J**	9.8 U	11 U	11 U	**4.8 J**	11 U
CHRYSENE	218-01-9	110000	1100	--	**29**	**33**	10 U	**24**	10 U	**9.7 J**	9.8 U	**5.8 J**	11 U	**9.5 J**	11 U
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	--	**3.2 J**	**4.1 J**	10 U	**2.5 J**	10 U	11 U	9.8 U	11 U	11 U	11 U	11 U
FLUORANTHENE	206-44-0	240000	29000	--	**52**	**63**	10 U	**44**	10 U	**17 J**	9.8 U	**7.2 J**	11 U	**14 J**	11 U
FLUORENE	86-73-7	240000	30000	--	11 U	11 U	10 U	11 U	10 U	11 U	9.8 U	11 U	11 U	11 U	11 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	--	**16 J**	**13 J**	10 U	**10 J**	10 U	**4.6 J**	9.8 U	**2.9 J**	11 U	**4.6 J**	11 U
NAPHTHALENE	91-20-3	2000	160	--	11 U	11 U	10 U	11 U	10 U	11 U	9.8 U	11 U	11 U	11 U	11 U
PHENANTHRENE	85-01-8	180000	29000	--	**29**	**37**	10 U	**24**	10 U	**8.4 J**	9.8 U	**4.2 J**	11 U	**7.5 J**	11 U
PYRENE	129-00-0	180000	1100	--	**31**	**37**	10 U	**29**	10 U	**9.5 J**	9.8 U	**6.8 J**	11 U	**11 J**	11 U
TOC (mg/kg)															
TOTAL ORGANIC CARBON	TOC	--	--	--	18000 J	22000 J	27000 J	---	---	29000 J	12000 J	---	---	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 1997)
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.

EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed.
J = Estimated value
Shaded:
> RIDEM Residential Direct Contact
>Human Health Screening Level
>Ecological Screening Level

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Table 5-4
Summary of Soil Analytical Data - Off-Site Background
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-406		SB-407		SB-408		SB-409		SB-410	
				SAMPLE ID	SB-406-CI20-0-1	SB-406-CI20-1-3	SB-407-CI20-0-1	SB-407-CI20-1-3	SB-408-CI20-0-1	SB-408-CI20-1-3	SB-409-CI20-0-1	SB-409-CI20-1-3	SB-410-CI20-0-1	SB-410-CI20-1-3
				SAMPLE DATE	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20
				QC IDENTIFIER										
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**										
METALS (mg/kg)														
ALUMINUM	7429-90-5	7700	--	--	**9450**	**10200**	**9930**	**13100**	**8210**	**10200**	**10700**	**11400**	**7720**	**12200**
ANTIMONY	7440-36-0	3.1	0.27	10	**0.14**	**0.065 J**	**0.05 J**	**0.044 J**	**0.045 J**	**0.041 J**	**0.04 J**	**0.049 J**	**0.058 J**	**0.055 J**
ARSENIC	7440-38-2	0.68	18	7	**5.97**	**2.53**	**2.55**	**2.56**	**2.81**	**2.41**	**2.53**	**2.49**	**2.34 J**	**2.88**
BARIUM	7440-39-3	1500	330	5500	**27.5**	**21.7**	**19.8**	**27.1**	**14.2**	**22.2**	**23.2**	**27.4**	**24.6**	**28.4**
BERYLLIUM	7440-41-7	16	10	0.4	**0.494**	**0.507**	**0.484**	**0.755**	**0.38**	**0.539**	**0.558**	**0.655**	**0.413**	**0.628**
CADMIUM	7440-43-9	7.1	0.36	39	**0.0861 J**	**0.058 J**	**0.052 J**	**0.0594 J**	**0.051 J**	**0.055 J**	**0.055 J**	**0.072 J**	**0.0658 J**	**0.0753 J**
CALCIUM	7440-70-2	EN	--	--	**934**	**469 J**	**396**	**426**	**367**	**329**	**359**	**418**	**1000**	**372**
CHROMIUM	7440-47-3	12000	0.4	1400/390	**10.1**	**9.92**	**10.6**	**9.48**	**9.01**	**9.47**	**9.62**	**9.58**	**8.14**	**10.2**
COBALT	7440-48-4	2.3	2.4	--	**2.92**	**3.18**	**2.69**	**2.53**	**2.78**	**2.55**	**2.95**	**2.68**	**2.66**	**3.1**
COPPER	7440-50-8	310	28	3100	**7.78**	**6.46**	**5.4**	**5.5**	**6.07**	**5.48**	**5.52**	**5.92**	**8.12**	**6.32**
IRON	7439-89-6	5500	--	--	**12200**	**12700**	**12200**	**12100**	**12500**	**12500**	**13100**	**13100**	**10900**	**13500**
LEAD	7439-92-1	400	11	150	**20.7**	**20.2**	**19.2**	**16.2**	**22.2**	**17.6**	**15.8**	**17.7**	**20.4 J**	**20**
MAGNESIUM	7439-95-4	EN	--	--	**1860**	**1930 J**	**1570**	**1600**	**1760**	**1640**	**1610**	**1600**	**1600**	**1700**
MANGANESE	7439-96-5	180	220	390	**176**	**123 J**	**106**	**128**	**97.7**	**118**	**118**	**113**	**118 J**	**125**
MERCURY	7439-97-6	2.3	0.013	23	**0.02 J**	0.035 U	**0.036**	**0.03 J**	**0.034 J**	**0.027 J**	**0.024 J**	**0.028 J**	**0.03 J**	**0.028 J**
NICKEL	7440-02-0	150	38	1000	**6.56**	**6.85**	**6.22**	**5.87**	**6.1**	**5.82**	**6.02**	**6.08**	**5.44**	**6.55**
POTASSIUM	7440-09-7	EN	--	--	**522**	**596**	**459**	**482**	**442**	**393**	**472**	**460**	**590 J**	**479**
SELENIUM	7782-49-2	39	0.52	390	**0.34 J**	**0.376 J**	**0.356 J**	**0.46**	**0.3 J**	**0.356 J**	**0.389 J**	**0.405 J**	**0.265 J**	**0.417 J**
SILVER	7440-22-4	39	4.2	200	**0.063 J**	**0.059 J**	**0.054 J**	**0.0812**	**0.037 J**	**0.0534 J**	**0.06 J**	**0.0649 J**	**0.075**	**0.0816 J**
SODIUM	7440-23-5	EN	--	--	110 U	80 U	84 U	66 U	72 U	75 U	94 U	96 U	66 U	90 U
THALLIUM	7440-28-0	0.078	0.22	5.5	**0.144**	**0.143**	**0.115**	**0.146**	**0.0962**	**0.111**	**0.123**	**0.143**	**0.107**	**0.149**
VANADIUM	7440-62-2	39	2	550	**15.4**	**16.9**	**15.5**	**16.4**	**14**	**15.1**	**16.2**	**16.5**	**12.5**	**18.2**
ZINC	7440-66-6	2300	46	6000	**30.9**	**26.1**	**21.3**	**22.4**	**20.8**	**21.4**	**21.9**	**24.6**	**30 J**	**25.4**
PAHs (µg/kg)														
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	12 U	11 U	**5.7 J**	12 U	11 U	12 U	11 U	12 U	12 U	**2.6 J**
2-METHYLNAPHTHALENE	91-57-6	24000	110	--	12 U	11 U	**4.1 J**	12 U	11 U	12 U	11 U	12 U	12 U	12 U
ACENAPHTHENE	83-32-9	360000	250	--	12 U	11 U	**15 J**	12 U	11 U	12 U	11 U	12 U	12 U	**3.2 J**
ACENAPHTHYLENE	208-96-8	--	340	--	**2.1 J**	**1.9 J**	**6.2 J**	12 U	11 U	12 U	11 U	12 U	12 U	**3.1 J**
ANTHRACENE	120-12-7	1800000	1.5	--	**3.4 J**	**2.8 J**	**21 J**	**4.1 J**	11 U	**2.9 J**	**4.1 J**	**4 J**	**2.7 J**	**8.5 J**
BENZO(A)ANTHRACENE	56-55-3	1100	1100	--	**32**	**24 J**	**72**	**18 J**	**23**	**18 J**	**21 J**	**24**	**15 J**	**43**
BENZO(A)PYRENE	50-32-8	110	1100	--	**35 J**	**29 J**	**59 J**	**19 J**	**27 J**	**23 J**	**22 J**	**29 J**	**14 J**	**39**
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	--	**51**	**45 J**	**82**	**28**	**48**	**37**	**33**	**44**	**22 J**	**59**
BENZO(G,H,I)PERYLENE	191-24-2	180000	1100	--	**29**	**22 J**	**39**	**17 J**	**24**	**24**	**17 J**	**23 J**	**11 J**	**25**
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	--	**22 J**	**17 J**	**34**	**14 J**	**16 J**	**12 J**	**13 J**	**17 J**	**8.5 J**	**20 J**
CHRYSENE	218-01-9	110000	1100	--	**48**	**38 J**	**94**	**28**	**42**	**32**	**30**	**36**	**21 J**	**53**
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	--	**6.7 J**	**7.2 J**	**13 J**	**4.1 J**	**6.8 J**	**5.6 J**	**5 J**	**6.2 J**	**3.3 J**	**8.7 J**
FLUORANTHENE	206-44-0	240000	29000	--	**69**	**57 J**	**160**	**44**	**62**	**51**	**48**	**60**	**36 J**	**89**
FLUORENE	86-73-7	240000	30000	--	12 U	11 U	**28**	12 U	11 U	12 U	11 U	12 U	12 U	**5.6 J**
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	--	**21 J**	**17 J**	**32**	**12 J**	**20 J**	**19 J**	**15 J**	**19 J**	**9.3 J**	**20 J**
NAPHTHALENE	91-20-3	2000	160	--	12 U	11 U	**3.5 J**	12 U	11 U	12 U	11 U	12 U	12 U	12 U
PHENANTHRENE	85-01-8	180000	29000	--	**27**	**36 J**	**210**	**31**	**42**	**31**	**31**	**35**	**20 J**	**67**
PYRENE	129-00-0	180000	1100	--	**68**	**57 J**	**180**	**43**	**61**	**38**	**39**	**44**	**26 J**	**75**
TOC (mg/kg)														
TOTAL ORGANIC CARBON	TOC	--	--	--	30000 J	22000 J	---	---	23000 J	28000 J	---	---	25000 J	31000 J

Notes:

1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 19
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.

EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed.
J = Estimated value
Shaded:
> RIDEM Residential Direct Contact
>Human Health Screening Level
>Ecological Screening Level

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Table 5-4
Summary of Soil Analytical Data - Off-Site Background
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-411		SB-412		SB-413		SB-414		SB-415	
				SAMPLE ID	SB-411-CI20-0-1	SB-411-CI20-1-3	SB-412-CI20-0-1	SB-412-CI20-1-3	SB-413-CI20-0-1	SB-413-CI20-1-3	SB-414-CI20-0-1	SB-414-CI20-1-3	SB-415-CI20-0-1	SB-415-CI20-1-3
				SAMPLE DATE	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20
				QC IDENTIFIER										
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**										
METALS (mg/kg)														
ALUMINUM	7429-90-5	7700	--	--	**7320**	**7220**	**8180**	**10500**	**8840**	**8160**	**6570**	**6730**	**6980**	**6830**
ANTIMONY	7440-36-0	3.1	0.27	10	**0.053 J**	**0.048 J**	**0.050 J**	**0.048 J**	**0.064 J**	**0.041 J**	**0.053 J**	**0.048 J**	**0.062 J**	**0.049 J**
ARSENIC	7440-38-2	0.68	18	7	**3.56**	**2.21**	**2.06**	**2.06**	**2.58**	**2.28**	**2.59**	**2.33**	**2.71**	**2.05**
BARIUM	7440-39-3	1500	330	5500	**30.7**	**24.6**	**20.0**	**20.3**	**23.0**	**19.4**	**41.4**	**17.5**	**37.4**	**21.7**
BERYLLIUM	7440-41-7	16	10	0.4	**0.419**	**0.46**	**0.437**	**0.520**	**0.419**	**0.468**	**0.372**	**0.472**	**0.431**	**0.459**
CADMIUM	7440-43-9	7.1	0.36	39	**0.101**	**0.0752**	**0.0726**	**0.046 J**	**0.0697 J**	**0.042 J**	**0.142**	**0.0450 J**	**0.118**	**0.0812 J**
CALCIUM	7440-70-2	EN	--	--	**1290**	**1560**	**724**	**546**	**702**	**946**	**1600**	**774**	**1940**	**1290**
CHROMIUM	7440-47-3	12000	0.4	1400/390	**8.09**	**8.86**	**9.54**	**12.4**	**10.2**	**10.8**	**9.00**	**10.1**	**10.1**	**6.34**
COBALT	7440-48-4	2.3	2.4	--	**3.66**	**3.94**	**3.35**	**3.40**	**3.22**	**4.56**	**4.20**	**4.38**	**4.82**	**2.34**
COPPER	7440-50-8	310	28	3100	**14.2**	**13.7**	**9.79**	**7.36**	**9.31**	**9.28**	**14**	**12**	**17.3**	**8.56**
IRON	7439-89-6	5500	--	--	**11600**	**10400**	**10700**	**14400**	**12900**	**13100**	**11900**	**13200**	**12600**	**8830**
LEAD	7439-92-1	400	11	150	**22.5**	**37.8**	**34.2**	**54.0**	**22.6**	**17.3**	**24.3**	**38.3**	**25.9**	**20.6**
MAGNESIUM	7439-95-4	EN	--	--	**2020**	**1860**	**1920**	**2110**	**2040**	**2650**	**2630**	**2280**	**3030**	**1190**
MANGANESE	7439-96-5	180	220	390	**137**	**114**	**135**	**135**	**111**	**152**	**181**	**132**	**207**	**99.4**
MERCURY	7439-97-6	2.3	0.013	23	**0.027 J**	**0.042**	**0.029 J**	**0.018 J**	**0.0542**	**0.010 J**	**0.050**	**0.0091 J**	**0.034**	**0.037 J**
NICKEL	7440-02-0	150	38	1000	**6.68**	**6.06**	**6.19**	**6.92**	**6.66**	**8.52**	**7.93**	**6.91**	**8.67**	**4.29**
POTASSIUM	7440-09-7	EN	--	--	**686**	**862**	**574**	**544**	**636**	**977**	**1010**	**811**	**1500**	**692**
SELENIUM	7782-49-2	39	0.52	390	**0.2 J**	**0.24 J**	**0.23 J**	**0.28 J**	**0.279 J**	**0.19 J**	**0.14 J**	**0.13 J**	**0.14 J**	**0.25 J**
SILVER	7440-22-4	39	4.2	200	**0.135**	**0.0966**	**0.0882**	**0.0517 J**	**0.0865**	**0.031 J**	**0.136**	**0.024 J**	**0.194**	**0.0966**
SODIUM	7440-23-5	EN	--	--	**104**	68 U	61 U	75 U	70 U	95 U	87 U	82 U	91 U	92 U
THALLIUM	7440-28-0	0.078	0.22	5.5	**0.0927**	**0.108**	**0.0929**	**0.106**	**0.102**	**0.140**	**0.092**	**0.124**	**0.0994**	**0.0971**
VANADIUM	7440-62-2	39	2	550	**14.6**	**12.2**	**11.9**	**15.7**	**15.1**	**14.5**	**12.7**	**12.3**	**12.5**	**10.6**
ZINC	7440-66-6	2300	46	6000	**34.2**	**34.5**	**34.6**	**26.6**	**27.5**	**26.2**	**51.4**	**31.8**	**45.0**	**33.6**
PAHs (µg/kg)														
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	**4.6 J**	**9.8 J**	**8.9 J**	**13 J**	**3.8 J**	**3.5 J**	**3.2 J**	**5.2 J**	**3.5 J**	**3 J**
2-METHYLNAPHTHALENE	91-57-6	24000	110	--	**4.7 J**	**10 J**	**11 J**	**15 J**	**3.9 J**	**3.7 J**	**3.5 J**	**4.0 J**	**3.6 J**	**2.8 J**
ACENAPHTHENE	83-32-9	360000	250	--	**2.8 J**	**16 J**	**25**	**13 J**	**2.5 J**	**5.1 J**	**2.2 J**	**5.8 J**	**2.0 J**	11 U
ACENAPHTHYLENE	208-96-8	--	340	--	**2.8 J**	**6 J**	**16 J**	**5.2 J**	**5.8 J**	**7.5 J**	**4.6 J**	**19**	**4.7 J**	**2.6 J**
ANTHRACENE	120-12-7	1800000	1.5	--	**9.2 J**	**110**	**37**	**19 J**	**9.9 J**	**14 J**	**12 J**	**30**	**9.7 J**	**4.2 J**
BENZO(A)ANTHRACENE	56-55-3	1100	1100	--	**83**	**840**	**260**	**100**	**71**	**160**	**91**	**200**	**95**	**43**
BENZO(A)PYRENE	50-32-8	110	1100	--	**84**	**800**	**280**	**110**	**74**	**170**	**94**	**190**	**99**	**47**
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	--	**130**	**1200**	**420**	**170**	**110**	**250**	**130**	**270**	**140**	**72**
BENZO(G,H,I)PERYLENE	191-24-2	180000	1100	--	**49**	**450**	**190**	**82**	**52**	**130**	**70**	**120**	**67**	**36**
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	--	**37**	**430**	**130**	**48**	**41**	**93**	**41**	**110**	**48**	**25**
CHRYSENE	218-01-9	110000	1100	--	**88**	**900**	**310**	**130**	**92**	**190**	**93**	**220**	**99**	**55**
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	--	**17 J**	**160**	**64**	**25**	**17 J**	**40**	**21**	**39**	**22**	**12 J**
FLUORANTHENE	206-44-0	240000	29000	--	**130**	**1200**	**380**	**170**	**150**	**220**	**130**	**330**	**140**	**72**
FLUORENE	86-73-7	240000	30000	--	10 U	**24**	**27**	**15 J**	**7.1 J**	**8.1 J**	**4.2 J**	**28**	**3.4 J**	11 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	--	**40**	**430**	**160**	**66**	**43**	**110**	**62**	**96**	**56**	**32**
NAPHTHALENE	91-20-3	2000	160	--	**8.1 J**	**14 J**	**37**	**13 J**	**6.8 J**	**7.3 J**	**6.2 J**	**6.6 J**	**5.1 J**	**3.5 J**
PHENANTHRENE	85-01-8	180000	29000	--	**52**	**510**	**290**	**140**	**120**	**140**	**83**	**280**	**67**	**35**
PYRENE	129-00-0	180000	1100	--	**120**	**1200**	**670**	**220**	**150**	**340**	**170**	**420**	**180**	**73**
TOC (mg/kg)														
TOTAL ORGANIC CARBON	TOC	--	--	--	26000 J	16000 J	---	---	25000 J	13000 J	---	---	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 19
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.

EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed.
J = Estimated value
Shaded:
> RIDEM Residential Direct Contact
>Human Health Screening Level
>Ecological Screening Level

Table 5-4
Summary of Soil Analytical Data - Off-Site Background
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SB-416			SB-417		SB-418		SB-419		SB-420	
				SAMPLE ID	SB-416-CI20-0-1	SB-416-CI20-1-3	SB-416-CI20-1-3-DUP	SB-417-CI20-0-1	SB-417-CI20-1-3	SB-418-CI20-0-1	SB-418-CI20-1-3	SB-419-CI20-0-1	SB-419-CI20-1-3	SB-420-CI20-0-1	SB-420-CI20-1-3
				SAMPLE DATE	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20
				QC IDENTIFIER		DUPLICATE	DUPLICATE								
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**											
METALS (mg/kg)															
ALUMINUM	7429-90-5	7700	--	--	**9340**	**10800**	**15700**	**5050**	**9210**	**4480**	**10900**	**3540**	**8710**	**13800**	**12700**
ANTIMONY	7440-36-0	3.1	0.27	10	**0.065 J**	**0.035 J**	**0.035 J**	0.037 **U**	**0.022 J**	**0.019 J**	**0.039 J**	**0.019 J**	**0.035 J**	**0.049 J**	**0.038 J**
ARSENIC	7440-38-2	0.68	18	7	**2.53**	**2.07**	**2.45**	**1.12**	**1.63**	**1.10**	**2.68**	**0.86**	**2.39**	**3.4**	**2.66**
BARIUM	7440-39-3	1500	330	5500	**23.0**	**17.6 J**	**31.5 J**	**12.4**	**17.5**	**10.0**	**19.7**	**8.88**	**12.7**	**21.3**	**15.7**
BERYLLIUM	7440-41-7	16	10	0.4	**0.466**	**0.569**	**0.799**	**0.670**	**0.396**	**0.719**	**0.654**	**0.575**	**0.624**	**0.969**	**0.592**
CADMIUM	7440-43-9	7.1	0.36	39	**0.0715 J**	**0.041 J**	**0.0621 J**	**0.045 J**	**0.025 J**	**0.042 J**	**0.033 J**	**0.039 J**	**0.02 J**	**0.064 J**	**0.045 J**
CALCIUM	7440-70-2	EN	--	--	**722**	**330**	**502**	**391**	**399**	**531**	**382**	**367**	**248**	**456**	**416**
CHROMIUM	7440-47-3	12000	0.4	1400/390	**9.90**	**8.34**	**11.1**	**3.90**	**11.9**	**2.94**	**12.4**	**2.62**	**10.0**	**11.8**	**12.0**
COBALT	7440-48-4	2.3	2.4	--	**3.56**	**2.62**	**2.61**	**2.09**	**3.73**	**1.88**	**4.97**	**1.63**	**3.07**	**2.91**	**2.59**
COPPER	7440-50-8	310	28	3100	**9.44**	**5.35**	**4.35**	**3.50**	**7.97**	**4.76**	**10.2**	**3.39**	**7.18**	**7.13**	**5.77**
IRON	7439-89-6	5500	--	--	**11700**	**9800**	**12800**	**7580**	**13200**	**8380**	**17800**	**6020**	**13000**	**14300**	**13300**
LEAD	7439-92-1	400	11	150	**22.1**	**9.20**	**9.74**	**7.52**	**5.79**	**6.77**	**8.49**	**12.1**	**8.73**	**11.2**	**8.10**
MAGNESIUM	7439-95-4	EN	--	--	**2350**	**1710**	**1610**	**1140**	**2970**	**1050**	**3230**	**714**	**2110**	**1810**	**1650**
MANGANESE	7439-96-5	180	220	390	**162**	**116**	**99.8**	**143**	**146**	**136**	**205**	**95.8**	**123**	**92**	**74.8**
MERCURY	7439-97-6	2.3	0.013	23	**0.033 J**	**0.021 J**	**0.027 J**	**0.0072 J**	**0.031 J**	0.033 U	0.036 U	0.027 U	0.034 U	0.036 U	0.032 U
NICKEL	7440-02-0	150	38	1000	**7.38**	**5.54**	**5.96**	**3.25**	**8.81**	**3.60**	**9.04**	**2.15**	**7.12**	**6.33**	**6.53**
POTASSIUM	7440-09-7	EN	--	--	**845**	**545**	**508**	**781**	**743**	**775**	**1060**	**560**	**691**	**580**	**529**
SELENIUM	7782-49-2	39	0.52	390	**0.314 J**	**0.260 J**	**0.445**	**0.120 J**	**0.14 J**	**0.059 J**	**0.180 J**	**0.062 J**	**0.120 J**	**0.440 J**	**0.345 J**
SILVER	7440-22-4	39	4.2	200	**0.0854**	**0.0682 J**	**0.0777**	**0.017 J**	**0.11**	**0.017 J**	**0.019 J**	**0.014 J**	**0.022 J**	**0.11 J**	**0.041 J**
SODIUM	7440-23-5	EN	--	--	73 U	84 U	72 U	75 U	**87.9**	92 U	86 U	76 U	68 U	92 U	87 U
THALLIUM	7440-28-0	0.078	0.22	5.5	**0.118**	**0.138**	**0.164**	**0.0872**	**0.121**	**0.0968**	**0.146**	**0.057 J**	**0.108**	**0.165**	**0.119**
VANADIUM	7440-62-2	39	2	550	**14.7**	**13.0**	**19.0**	**6.24**	**14.9**	**4.8**	**18.0**	**3.99**	**12.9**	**19.6**	**20.8**
ZINC	7440-66-6	2300	46	6000	**29.8**	**19.9**	**22.5**	**27.0**	**29.8**	**39.7**	**28.2**	**26.2**	**19.0**	**31.5**	**23.0**
PAHs (µg/kg)															
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	11 U	11 U	11 U	11 U	9.9 U	11 U	10 U	9.7 U	10 U	10 U	11 U
2-METHYLNAPHTHALENE	91-57-6	24000	110	--	11 U	11 U	11 U	11 U	9.9 U	11 U	10 U	9.7 U	10 U	10 U	11 U
ACENAPHTHENE	83-32-9	360000	250	--	11 U	11 U	11 U	11 U	9.9 U	11 U	10 U	9.7 U	10 U	10 U	11 U
ACENAPHTHYLENE	208-96-8	--	340	--	**3.0 J**	11 U	11 U	11 U	9.9 U	11 U	10 U	9.7 U	10 U	10 U	11 U
ANTHRACENE	120-12-7	1800000	1.5	--	**3.6 J**	11 U	**2.5 J**	11 U	9.9 U	11 U	10 U	9.7 U	10 U	10 U	11 U
BENZO(A)ANTHRACENE	56-55-3	1100	1100	--	**44**	**9.5 J**	**20 J**	**5.8 J**	9.9 U	**8.1 J**	10 U	**9.1 J**	10 U	**3.8 J**	11 U
BENZO(A)PYRENE	50-32-8	110	1100	--	**45**	**12 J**	**27**	**6.4 J**	9.9 U	**10 J**	10 U	**11 J**	**10** UJ	**4.5 J**	**11** UJ
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	--	**70**	**22**	**45**	**13 J**	9.9 U	**16 J**	10 U	**18 J**	10 U	**7.4 J**	11 U
BENZO(G,H,I)PERYLENE	191-24-2	180000	1100	--	**35**	**12 J**	**21 J**	**6.6 J**	9.9 U	**8.2 J**	10 U	**11 J**	10 U	**4.1 J**	11 U
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	--	**25**	**8.9 J**	**17 J**	**4.3 J**	9.9 U	**7.5 J**	10 U	**8 J**	10 U	**3.6 J**	11 U
CHRYSENE	218-01-9	110000	1100	--	**54**	**15 J**	**35**	**9.5 J**	9.9 U	**13 J**	10 U	19 U	10 U	21 U	22 U
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	--	**10 J**	**2.4 J**	**6.8 J**	11 U	9.9 U	**2.6 J**	10 U	**2 J**	10 U	10 U	11 U
FLUORANTHENE	206-44-0	240000	29000	--	**80**	**23**	**52**	**14 J**	9.9 U	**21**	10 U	**21**	10 U	**7.6 J**	11 U
FLUORENE	86-73-7	240000	30000	--	11 U	11 U	11 U	11 U	9.9 U	11 U	10 U	9.7 U	10 U	10 U	11 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	--	**28**	**9.2 J**	**16 J**	**4.8 J**	9.9 U	**6.5 J**	10 U	**8.2 J**	10 U	**3.7 J**	11 U
NAPHTHALENE	91-20-3	2000	160	--	11 U	11 U	11 U	11 U	9.9 U	11 U	10 U	9.7 U	10 U	10 U	11 U
PHENANTHRENE	85-01-8	180000	29000	--	**39**	**9.7 J**	**29**	**7.7 J**	9.9 U	**11 J**	10 U	**8.7 J**	10 U	**4.3 J**	11 U
PYRENE	129-00-0	180000	1100	--	**82**	**19 J**	**49**	**12 J**	9.9 U	**18 J**	10 U	**19**	10 U	**7.3 J**	11 U
TOC (mg/kg)															
TOTAL ORGANIC CARBON	TOC	--	--	--	34000 J	16000 J	32000 J	---	---	9900 J	21000 J	---	---	22000 J	16000 J

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 19
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.

EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed.
J = Estimated value
Shaded:
> RIDEM Residential Direct Contact
>Human Health Screening Level
>Ecological Screening Level

Table 5-5
Summary of Hydric Soil Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-1A			SSH-2A		SSH-3A			SSH-4A		SSH-5A	
				SAMPLE ID	SSH-1A 0-1	SSH-1A 0-1DUP	SSH-1A 1-2	SSH-2A 0-1	SSH-2A 1-2	SSH-3A 0-1	SSH-3A-D 0-1	SSH-3A 1-2	SSH-4A 0-1	SSH-4A 1-2	SSH-5A 0-1	SSH-5A 1-2
				SAMPLE DATE	30-Nov-11	30-Nov-11	30-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11
				QC IDENTIFIER	DUPLICATE	DUPLICATE				DUPLICATE	DUPLICATE					
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
VOCs (µg/kg)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	2200	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	540000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,1,2-TRICHLOROETHANE	79-00-5	150	320	3600	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,1-DICHLOROETHANE	75-34-3	3600	140	920000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,1-DICHLOROETHENE	75-35-4	23000	40	200	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,1-DICHLOROPROPENE	563-58-6	--	--	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,2-DIBROMOETHANE	106-93-4	36	1230	10	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,2-DICHLOROBENZENE	95-50-1	180000	90	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,2-DICHLOROETHANE	107-06-2	460	400	900	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,2-DICHLOROPROPANE	78-87-5	1600	280	1900	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,3-DICHLOROBENZENE	541-73-1	--	80	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
1,4-DICHLOROBENZENE	106-46-7	2600	880	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
2,2-DICHLOROPROPANE	594-20-7	--	--	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
2-BUTANONE (MEK)	78-93-3	2700000	1000	--	**10.5 J**	---	**25.0 J**	136 U	**16.1 J**	**12.5 J**	151 U	**11.9 J**	242 U	**16.2 J**	**17.3 J**	**14.6 J**
2-CHLOROTOLUENE	95-49-8	160000	--	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
2-HEXANONE	591-78-6	20000	360	--	117 U	---	143 U	136 U	179 U	161 U	151 U	203 U	242 U	205 U	162 U	145 U
4-CHLOROTOLUENE	106-43-4	160000	--	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
4-ISOPROPYLTOLUENE	99-87-6	190000	10	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	--	117 U	---	143 U	136 U	179 U	161 U	151 U	203 U	242 U	205 U	162 U	145 U
ACETONE	67-64-1	6100000	1200	7800000	166 U	---	**338**	**119 J**	**287**	**238**	**167**	**117 J**	**733**	**233**	**676**	**130 J**
BENZENE	71-43-2	1200	120	2500	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
BROMOBENZENE	108-86-1	29000	--	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
BROMOCHLOROMETHANE	74-97-5	15000	--	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
BROMODICHLOROMETHANE	75-27-4	290	540	10000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
BROMOFORM	75-25-2	19000	70	81000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
CARBON DISULFIDE	75-15-0	77000	5	--	11.7 U	---	15.4 U	13.6 U	**11.0 J**	**31.9**	**5.2 J**	**13.6 J**	24.2 U	**14.7 J**	**8.6 J**	**12.4 J**
CARBON TETRACHLORIDE	56-23-5	650	50	1500	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
CHLOROBENZENE	108-90-7	28000	2400	210000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
CHLOROETHANE	75-00-3	1400000	--	--	23.5 U	---	28.6 U	27.2 U	35.7 U	32.3 U	30.2 U	40.6 U	48.4 U	41 U	32.4 U	28.9 U
CHLOROFORM	67-66-3	320	50	1200	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
CHLOROMETHANE	74-87-3	11000	10400	--	23.5 U	---	28.6 U	27.2 U	35.7 U	32.3 U	30.2 U	40.6 U	48.4 U	41 U	32.4 U	28.9 U
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	630000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	398	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
DIBROMOMETHANE	74-95-3	2400	65000	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	--	23.5 U	---	28.6 U	27.2 U	35.7 U	32.3 U	30.2 U	40.6 U	48.4 U	41 U	32.4 U	28.9 U
ETHYLBENZENE	100-41-4	5800	270	71000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
HEXACHLOROBUTADIENE	87-68-3	1200	9	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
ISOPROPYLBENZENE	98-82-8	190000	40	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
METHYL BROMIDE	74-83-9	--	--	800	23.5 U	---	28.6 U	27.2 U	35.7 U	32.3 U	30.2 U	40.6 U	48.4 U	41 U	32.4 U	28.9 U
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
METHYLENE CHLORIDE	75-09-2	35000	210	45000	58.6 U	---	71.4 U	67.9 U	89.3 U	80.7 U	75.5 U	101 U	121 U	102 U	80.9 U	72.3 U
NAPHTHALENE	91-20-3	3800	20000	--	0.0117 U	---	0.0143 U	0.0136 U	0.179 U	0.0161 U	0.0151 U	0.0203 U	0.0242 U	0.0205 U	0.0162 U	0.0145 U
N-BUTYL BENZENE	104-51-8	390000	--	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
N-PROPYL BENZENE	103-65-1	380000	--	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
SEC-BUTYL BENZENE	135-98-8	780000	--	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
STYRENE	100-42-5	600000	1200	13000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
TERT-BUTYLBENZENE	98-06-6	780000	--	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
TETRACHLOROETHENE	127-18-4	8100	60	12000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
TOLUENE	108-88-3	490000	10	190000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	1100000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U

Table 5-5
Summary of Hydric Soil Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-1A			SSH-2A		SSH-3A			SSH-4A		SSH-5A	
				SAMPLE ID	SSH-1A 0-1	SSH-1A 0-1DUP	SSH-1A 1-2	SSH-2A 0-1	SSH-2A 1-2	SSH-3A 0-1	SSH-3A-D 0-1	SSH-3A 1-2	SSH-4A 0-1	SSH-4A 1-2	SSH-5A 0-1	SSH-5A 1-2
				SAMPLE DATE	30-Nov-11	30-Nov-11	30-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11
				QC IDENTIFIER	DUPLICATE	DUPLICATE				DUPLICATE	DUPLICATE					
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
VOCs (µg/kg)																
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	398	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
TRICHLOROETHYLENE	79-01-6	410	60	13000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
VINYL CHLORIDE	75-01-4	59	30	20	23.5 U	---	28.6 U	27.2 U	35.7 U	32.3 U	30.2 U	40.6 U	48.4 U	41.0 U	32.4 U	28.9 U
XYLENE O	95-47-6	65000	100	--	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
XYLENE P,M	179601-23-1	--	100	--	23.5 U	---	28.6 U	27.2 U	35.7 U	32.3 U	30.2 U	40.6 U	48.4 U	41.0 U	32.4 U	28.9 U
TOTAL XYLENES	1330-20-7	58000	--	110000	11.7 U	---	14.3 U	13.6 U	17.9 U	16.1 U	15.1 U	20.3 U	24.2 U	20.5 U	16.2 U	14.5 U
SVOC (µg/kg)																
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	--	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	80	--	---	---	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	--	---	---	---	---	---	---	---	---	---	---	---	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DICHLOROPHENOL	120-83-2	19000	10	30000	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DINITROPHENOL	51-28-5	13000	61	--	---	---	---	---	---	---	---	---	---	---	---	---
2,4-DINITROTOLUENE	121-14-2	1700	6000	--	---	---	---	---	---	---	---	---	---	---	---	---
2,6-DINITROTOLUENE	606-20-2	360	4000	--	---	---	---	---	---	---	---	---	---	---	---	---
2-CHLOROPHENOL	95-57-8	39000	60	--	---	---	---	---	---	---	---	---	---	---	---	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	--	---	---	---	---	---	---	---	---	---	---	---	---
2-NITROANILINE	88-74-4	63000	20	--	---	---	---	---	---	---	---	---	---	---	---	---
2-NITROPHENOL	88-75-5	--	1600	--	---	---	---	---	---	---	---	---	---	---	---	---
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	--	---	---	---	---	---	---	---	---	---	---	---	---
3-NITROANILINE	99-09-2	--	3160	--	---	---	---	---	---	---	---	---	---	---	---	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	--	---	---	---	---	---	---	---	---	---	---	---	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLORO-3-METHYLPHENOL	59-50-7	630000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROANILINE	106-47-8	2700	1000	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-NITROANILINE	100-01-6	25000	21900	--	---	---	---	---	---	---	---	---	---	---	---	---
4-NITROPHENOL	100-02-7	--	5120	--	---	---	---	---	---	---	---	---	---	---	---	---
BENZOIC ACID	65-85-0	25000000	10	--	---	---	---	---	---	---	---	---	---	---	---	---
BENZYL ALCOHOL	100-51-6	630000	2	--	---	---	---	---	---	---	---	---	---	---	---	---
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	--	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
CARBAZOLE	86-74-8	--	70	--	---	---	---	---	---	---	---	---	---	---	---	---
CRESOLS, M- & P-		--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
DIBENZOFURAN	132-64-9	7300	150	--	---	---	---	---	---	---	---	---	---	---	---	---
DIETHYL PHTHALATE	84-66-2	5100000	250	--	---	---	---	---	---	---	---	---	---	---	---	---
DIMETHYL PHTHALATE	131-11-3	--	100000	--	---	---	---	---	---	---	---	---	---	---	---	---
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	--	---	---	---	---	---	---	---	---	---	---	---	---
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	--	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBENZENE	118-74-1	210	79	--	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROETHANE	67-72-1	1800	24	--	---	---	---	---	---	---	---	---	---	---	---	---
ISOPHORONE	78-59-1	570000	139000	--	---	---	---	---	---	---	---	---	---	---	---	---
NITROBENZENE	98-95-3	5100	2200	--	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	--	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	--	---	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	--	---	---	---	---	---	---	---	---	---	---	---	---
PENTACHLOROPHENOL	87-86-5	1000	2100	--	---	---	---	---	---	---	---	---	---	---	---	---
PHENOL	108-95-2	1900000	30000	--	---	---	---	---	---	---	---	---	---	---	---	---

Table 5-5
Summary of Hydric Soil Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-1A			SSH-2A		SSH-3A			SSH-4A		SSH-5A	
				SAMPLE ID	SSH-1A 0-1	SSH-1A 0-1DUP	SSH-1A 1-2	SSH-2A 0-1	SSH-2A 1-2	SSH-3A 0-1	SSH-3A-D 0-1	SSH-3A 1-2	SSH-4A 0-1	SSH-4A 1-2	SSH-5A 0-1	SSH-5A 1-2
				SAMPLE DATE	30-Nov-11	30-Nov-11	30-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11
				QC IDENTIFIER	DUPLICATE	DUPLICATE				DUPLICATE	DUPLICATE					
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
PAHs (µg/kg)																
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	---	---	---	---	---	---	---	---	---	---	---	---
2-METHYLNAPHTHALENE	91-57-6	24000	110	123000	---	---	---	---	---	---	---	---	---	---	---	---
ACENAPHTHENE	83-32-9	360000	250	43000	---	---	---	---	---	---	---	---	---	---	---	---
ACENAPHTHYLENE	208-96-8	360000	340	23000	---	---	---	---	---	---	---	---	---	---	---	---
ANTHRACENE	120-12-7	1800000	1.5	35000	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(A)ANTHRACENE	56-55-3	1100	1100	900	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(A)PYRENE	50-32-8	110	1100	400	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	900	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	800	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	900	---	---	---	---	---	---	---	---	---	---	---	---
CHRYSENE	218-01-9	110000	1100	400	---	---	---	---	---	---	---	---	---	---	---	---
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	400	---	---	---	---	---	---	---	---	---	---	---	---
FLUORANTHENE	206-44-0	240000	29000	20000	---	---	---	---	---	---	---	---	---	---	---	---
FLUORENE	86-73-7	240000	30000	28000	---	---	---	---	---	---	---	---	---	---	---	---
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	900	---	---	---	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	2000	160	54000	---	---	---	---	---	---	---	---	---	---	---	---
PHENANTHRENE	85-01-8	180000	29000	40000	---	---	---	---	---	---	---	---	---	---	---	---
PYRENE	129-00-0	180000	1100	13000	---	---	---	---	---	---	---	---	---	---	---	---
PCBs (µg/kg)																
AROCLOR 1016	12674-11-2	410	--	--	125 U	---	145 U	172 U	200 U	192 U	140 U	245 U	265 U	298 U	231 U	215 U
AROCLOR 1221	11104-28-2	200	--	--	125 U	---	145 U	172 U	200 U	192 U	140 U	245 U	265 U	298 U	231 U	215 U
AROCLOR 1232	11141-16-5	170	--	--	125 U	---	145 U	172 U	200 U	192 U	140 U	245 U	265 U	298 U	231 U	215 U
AROCLOR 1242	53469-21-9	230	--	--	125 U	---	145 U	172 U	200 U	192 U	140 U	245 U	265 U	298 U	231 U	215 U
AROCLOR 1248	12672-29-6	230	--	--	125 U	---	145 U	172 U	200 U	192 U	140 U	245 U	265 U	298 U	231 U	215 U
AROCLOR 1254	11097-69-1	120	--	--	125 U	---	145 U	172 U	200 U	192 U	140 U	245 U	265 U	298 U	231 U	215 U
AROCLOR 1260	11096-82-5	240	20	--	**64.7 J**	---	145 U	**61.3 J**	200 U	**118 J**	**53.1 J**	245 U	**134 J**	298 U	231 U	215 U
TOTAL PCBS	1336-36-3	120	20	10000	**64.7 J**	---	145 U	**61.3 J**	200 U	**118 J**	**53.1 J**	245 U	**134 J**	298 U	231 U	215 U
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700	--	--	---	---	---	---	---	---	---	---	---	---	---	---
ANTIMONY	7440-36-0	3.1	0.27	10	---	---	---	---	---	---	---	---	---	---	---	---
ARSENIC	7440-38-2	0.68	18	7	**5.9**	**5.7**	**6.1**	**4.4 J**	**5.2 J**	**4.3 J**	**2.9 J**	**3.8 J**	**7.6 J**	**6.6 J**	**10.5**	**5.0 J**
BARIUM	7440-39-3	1500	330	5500	**5.2**	**5.1**	**6.6**	**8.3**	**9.9**	**8.5 J**	**5.0 J**	**7.7 J**	**9.9 J**	**8.9 J**	**11.5**	**7.0 J**
BERYLLIUM	7440-41-7	16	10	0.4	---	---	---	---	---	---	---	---	---	---	---	---
CADMIUM	7440-43-9	7.1	0.36	39	**0.30 J**	**0.21 J**	**0.20 J**	1.4 U	1.3 U	**0.60 J**	**0.20 J**	1.8 U	**0.30 J**	**1.0 J**	**0.40 J**	1.6 U
CALCIUM	7440-70-2	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
CHROMIUM	7440-47-3	12000	0.4	1400/390	**8.40**	**8.11**	**8.60**	**16.3**	**16.8**	**16.6**	**10.7**	**11.3**	**18.9**	**16.0**	**21.3**	**9.90**
COBALT	7440-48-4	2.3	2.4	--	---	---	---	---	---	---	---	---	---	---	---	---
COPPER	7440-50-8	310	28	3100	---	---	---	---	---	---	---	---	---	---	---	---
IRON	7439-89-6	5500	--	--	---	---	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	400	11	150	**37.5**	**40.5**	**17.1**	**41.8**	**31.5**	**74.8**	**38.0**	**22.0**	**93.1**	**81.4**	**158**	**33.6**
MAGNESIUM	7439-95-4	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
MANGANESE	7439-96-5	180	220	390	---	---	---	---	---	---	---	---	---	---	---	---
MERCURY	7439-97-6	2.3	0.013	23	0.042 U	---	0.041 U	0.083 U	**0.069 J**	**0.058 J**	**0.030 J**	0.098 U	**0.070 J**	0.173 U	**0.120 J**	0.119 U
NICKEL	7440-02-0	150	38	1000	---	---	---	---	---	---	---	---	---	---	---	---
POTASSIUM	7440-09-7	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
SELENIUM	7782-49-2	39	0.52	390	7.1 U	7.1 U	9.1 U	**2.3 J**	13.2 U	**2.2 J**	11.9 U	18.4 U	**3.6 J**	**4.6 J**	**3.5 J**	16.3 U
SILVER	7440-22-4	39	4.2	200	0.7 U	0.7 U	0.9 U	1.4 U	1.3 U	1.8 U	1.2 U	1.8 U	2.4 U	3.0 U	1.9 U	1.6 U
SODIUM	7440-23-5	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
THALLIUM	7440-28-0	0.078	0.22	5.5	---	---	---	---	---	---	---	---	---	---	---	---
VANADIUM	7440-62-2	39	2	550	---	---	---	---	---	---	---	---	---	---	---	---
ZINC	7440-66-6	2300	46	6000	---	---	---	---	---	---	---	---	---	---	---	---

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Table 5-5
Summary of Hydric Soil Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-1A			SSH-2A		SSH-3A			SSH-4A		SSH-5A	
				SAMPLE ID	SSH-1A 0-1	SSH-1A 0-1DUP	SSH-1A 1-2	SSH-2A 0-1	SSH-2A 1-2	SSH-3A 0-1	SSH-3A-D 0-1	SSH-3A 1-2	SSH-4A 0-1	SSH-4A 1-2	SSH-5A 0-1	SSH-5A 1-2
				SAMPLE DATE	30-Nov-11	30-Nov-11	30-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11
				QC IDENTIFIER	DUPLICATE	DUPLICATE				DUPLICATE	DUPLICATE					
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
TOC (mg/kg)																
TOTAL ORGANIC CARBON		--	--	--	**46700**	**---**	**51400**	**133000**	**117000**	**182000**	**203000**	**206000**	**239000**	**175000**	**188000**	**264000**

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 1997)
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

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Table 5-5
Summary of Hydric Soil Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-6A		SSH-301			SSH-302			SSH-303		SSH-304	
				SAMPLE ID	SSH-6A 0-1	SSH-6A 1-2	SSH-301-CI19-0-1	SSH-301-CI19-0-1-DUP	SSH-301-CI19-1-2	SSH-302-CI19-0-1	SSH-302-CI19-1-2	SSH-302-CI19-1-2-DUP	SSH-303-CI19-0-1	SSH-303-CI19-1-2	SSH-304-CI19-0-1	SSH-304-CI19-1-2
				SAMPLE DATE	29-Nov-11	29-Nov-11	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19
				QC IDENTIFIER			DUPLICATE	DUPLICATE			DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
VOCs (µg/kg)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	2200	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	540000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	320	3600	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	140	920000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	40	200	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6	--	--	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	1230	10	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	400	900	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	280	1900	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	80	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7	--	--	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	1000	--	**92.5 J**	**68.9** J	---	---	---	---	---	---	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000	--	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
2-HEXANONE	591-78-6	20000	360	--	694 U	181 U	---	---	---	---	---	---	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000	--	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	10	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	--	694 U	181 U	---	---	---	---	---	---	---	---	---	---
ACETONE	67-64-1	6100000	1200	7800000	**4290**	**187**	---	---	---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	120	2500	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
BROMOBENZENE	108-86-1	29000	--	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000	--	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	540	10000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
BROMOFORM	75-25-2	19000	70	81000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	5	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	50	1500	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
CHLOROBENZENE	108-90-7	28000	2400	210000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
CHLOROETHANE	75-00-3	1400000	--	--	139 U	36.3 U	---	---	---	---	---	---	---	---	---	---
CHLOROFORM	67-66-3	320	50	1200	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
CHLOROMETHANE	74-87-3	11000	10400	--	139 U	36.3 U	---	---	---	---	---	---	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	630000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	398	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	65000	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	--	139 U	36.3 U	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	71000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBUTADIENE	87-68-3	1200	9	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	40	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
METHYL BROMIDE	74-83-9	--	--	800	139 U	36.3 U	---	---	---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
METHYLENE CHLORIDE	75-09-2	35000	210	45000	347 U	90.7 U	---	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	3800	20000	--	0.0694 U	0.0181 U	---	---	---	---	---	---	---	---	---	---
N-BUTYL BENZENE	104-51-8	390000	--	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000	--	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000	--	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
STYRENE	100-42-5	600000	1200	13000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000	--	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60	12000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	490000	10	190000	**71.9**	**11.8** J	---	---	---	---	---	---	---	---	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	1100000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---

Table 5-5
Summary of Hydric Soil Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-6A		SSH-301			SSH-302			SSH-303		SSH-304	
				SAMPLE ID	SSH-6A 0-1	SSH-6A 1-2	SSH-301-CI19-0-1	SSH-301-CI19-0-1-DUP	SSH-301-CI19-1-2	SSH-302-CI19-0-1	SSH-302-CI19-1-2	SSH-302-CI19-1-2-DUP	SSH-303-CI19-0-1	SSH-303-CI19-1-2	SSH-304-CI19-0-1	SSH-304-CI19-1-2
				SAMPLE DATE	29-Nov-11	29-Nov-11	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19
				QC IDENTIFIER			DUPLICATE	DUPLICATE			DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
VOCs (µg/kg)																
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	398	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60	13000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
VINYL CHLORIDE	75-01-4	59	30	20	139 U	36.3 U	---	---	---	---	---	---	---	---	---	---
XYLENE O	95-47-6	65000	100	--	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
XYLENE P,M	179601-23-1	--	100	--	139 U	36.3 U	---	---	---	---	---	---	---	---	---	---
TOTAL XYLENES	1330-20-7	58000	--	110000	69.4 U	18.1 U	---	---	---	---	---	---	---	---	---	---
SVOC (µg/kg)																
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
1,2-DICHLOROBENZENE	95-50-1	180000	90	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
1,3-DICHLOROBENZENE	541-73-1	--	80	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
1,4-DICHLOROBENZENE	106-46-7	2600	880	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000	--	--	---	---	510 UJ	680 UJ	1800 UJ	1600 UJ	1600 UJ	1600 U	1800 UJ	1300 UJ	580 UJ	980 UJ
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	--	---	---	1200 U	1700 U	4600 U	4000 U	4000 U	4100 U	4400 U	3100 U	1400 U	2400 U
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	--	---	---	510 U	680 U	1800 U	1600 U	1600 U	1600 U	1800 U	1300 U	580 U	980 U
2,4-DICHLOROPHENOL	120-83-2	19000	10	30000	---	---	510 U	**680**	**1800**	**1600**	**1600**	**1600**	**1800**	**1300**	**580**	**980**
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	--	---	---	510 UJ	680 UJ	1800 UJ	1600 UJ	1600 UJ	1600 U	1800 UJ	1300 UJ	580 UJ	980 UJ
2,4-DINITROPHENOL	51-28-5	13000	61	--	---	---	1200 UJ	1700 UJ	4600 UJ	4000 UJ	4000 UJ	4100 UJ	4400 UJ	3100 UJ	1400 UJ	2400 UJ
2,4-DINITROTOLUENE	121-14-2	1700	6000	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
2,6-DINITROTOLUENE	606-20-2	360	4000	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
2-CHLOROPHENOL	95-57-8	39000	60	--	---	---	510 U	680 U	1800 U	1600 U	1600 U	1600 U	1800 U	1300 U	580 U	980 U
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	--	---	---	510 U	680 U	1800 U	1600 U	1600 U	1600 U	1800 U	1300 U	580 U	980 U
2-NITROANILINE	88-74-4	63000	20	--	---	---	1200 UJ	1700 UJ	4600 UJ	4000 UJ	4000 UJ	4100 U	4400 UJ	3100 UJ	1400 UJ	2400 UJ
2-NITROPHENOL	88-75-5	--	1600	--	---	---	510 U	680 U	1800 U	1600 U	1600 U	1600 U	1800 U	1300 U	580 U	980 U
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
3-NITROANILINE	99-09-2	--	3160	--	---	---	1200 U	1700 U	4600 U	4000 UJ	4000 U	4100 U	4400 U	3100 UJ	1400 U	2400 U
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	--	---	---	1200 U	1700 U	4600 U	4000 U	4000 U	4100 U	4400 U	3100 U	1400 U	2400 U
4-BROMOPHENYL PHENYL ETHER	101-55-3	--	--	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
4-CHLORO-3-METHYLPHENOL	59-50-7	630000	--	--	---	---	510 U	680 U	1800 U	1600 U	1600 U	1600 U	1800 U	1300 U	580 U	980 U
4-CHLOROANILINE	106-47-8	2700	1000	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	--	--	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
4-NITROANILINE	100-01-6	25000	21900	--	---	---	1200 U	1700 U	4600 U	4000 UJ	4000 U	4100 U	4400 U	3100 UJ	1400 U	2400 U
4-NITROPHENOL	100-02-7	--	5120	--	---	---	1200 U	1700 U	4600 U	4000 U	4000 U	4100 U	4400 U	3100 U	1400 U	2400 U
BENZOIC ACID	65-85-0	25000000	10	--	---	---	1200 UJ	1700 UJ	4600 UJ	4000 UJ	4000 UJ	4100 U	4400 UJ	3100 UJ	1400 UJ	2400 UJ
BENZYL ALCOHOL	100-51-6	630000	2	--	---	---	1000 U	1400 U	3700 U	3200 UJ	3200 U	3300 U	3500 U	2500 UJ	1200 U	2000 U
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000	--	--	---	---	510 UJ	680 UJ	1800 UJ	1600 UJ	1600 UJ	1600 U	1800 UJ	1300 UJ	580 UJ	980 UJ
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230	--	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	--	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
CARBAZOLE	86-74-8	--	70	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
CRESOLS, M- & P-		--	--	--	---	---	510 UJ	680 UJ	1800 UJ	1600 UJ	1600 UJ	1600 U	1800 UJ	1300 UJ	580 UJ	980 UJ
DIBENZOFURAN	132-64-9	7300	150	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
DIETHYL PHTHALATE	84-66-2	5100000	250	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
DIMETHYL PHTHALATE	131-11-3	--	100000	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
HEXACHLOROBENZENE	118-74-1	210	79	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
HEXACHLOROETHANE	67-72-1	1800	24	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
ISOPHORONE	78-59-1	570000	139000	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
NITROBENZENE	98-95-3	5100	2200	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	--	---	---	510 UJ	680 UJ	1800 UJ	1600 UJ	1600 UJ	1600 U	1800 UJ	1300 UJ	580 UJ	980 UJ
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	--	---	---	510 U	680 U	1800 U	1600 UJ	1600 U	1600 U	1800 U	1300 UJ	580 U	980 U
PENTACHLOROPHENOL	87-86-5	1000	2100	--	---	---	1200 U	1700 U	4600 U	4000 U	4000 U	4100 U	4400 U	3100 U	1400 U	2400 U
PHENOL	108-95-2	1900000	30000	--	---	---	510 UJ	680 UJ	1800 UJ	1600 UJ	1600 UJ	1600 U	1800 UJ	1300 UJ	580 UJ	980 UJ

Table 5-5
Summary of Hydric Soil Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-6A		SSH-301			SSH-302			SSH-303		SSH-304	
				SAMPLE ID	SSH-6A 0-1	SSH-6A 1-2	SSH-301-CI19-0-1	SSH-301-CI19-0-1-DUP	SSH-301-CI19-1-2	SSH-302-CI19-0-1	SSH-302-CI19-1-2	SSH-302-CI19-1-2-DUP	SSH-303-CI19-0-1	SSH-303-CI19-1-2	SSH-304-CI19-0-1	SSH-304-CI19-1-2
				SAMPLE DATE	29-Nov-11	29-Nov-11	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19
				QC IDENTIFIER			DUPLICATE	DUPLICATE			DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
PAHs (µg/kg)																
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	---	---	**470 J**	**200 J**	75 U	**74 J**	64 U	62 U	71 U	51 U	**24 J**	40 U
2-METHYLNAPHTHALENE	91-57-6	24000	110	123000	---	---	**460 J**	**200 J**	75 U	**100 J**	64 U	62 U	**45 J**	51 U	**52**	40 U
ACENAPHTHENE	83-32-9	360000	250	43000	---	---	**62**	**32 J**	75 U	**19**	64 U	62 U	**71**	51 U	**27**	40 U
ACENAPHTHYLENE	208-96-8	360000	340	23000	---	---	**63**	**44 J**	75 U	**32**	64 U	62 U	**71**	51 U	**29**	40 U
ANTHRACENE	120-12-7	1800000	1.5	35000	---	---	**140**	**66**	75 U	**65**	**64**	**62**	**71**	**51**	**390**	**40**
BENZO(A)ANTHRACENE	56-55-3	1100	1100	900	---	---	**1500 J**	**600 J**	150 U	**440**	64 U	62 U	**210**	51 U	**3600**	79 U
BENZO(A)PYRENE	50-32-8	110	1100	400	---	---	**2100 J**	**880 J**	**52 J**	**640**	64 U	62 U	**300**	51 U	**3000**	**25 J**
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	900	---	---	**2200 J**	**980 J**	**120 J**	**790**	**67 J**	**59 J**	**520**	51 U	**4300**	40 U
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	800	---	---	**990 J**	**480 J**	75 U	**390**	64 U	62 U	**170**	51 U	**1600**	40 U
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	900	---	---	**540 J**	**280 J**	75 U	**180**	64 U	62 U	**74**	51 U	**1800**	40 U
CHRYSENE	218-01-9	110000	1100	400	---	---	**2700 J**	**1100 J**	150 U	**870**	64 U	62 U	**370**	51 U	**3900**	79 U
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	400	---	---	**250 J**	**160 J**	75 U	**80 J**	64 U	62 U	**19 J**	51 U	**490**	**8.2 J**
FLUORANTHENE	206-44-0	240000	29000	20000	---	---	**2400 J**	**910 J**	150 U	**800**	130 U	120 U	**480**	100 U	**8200**	79 U
FLUORENE	86-73-7	240000	30000	28000	---	---	**290 J**	**150 J**	75 U	**82 J**	64 U	62 U	**41 J**	51 U	**140**	40 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	900	---	---	**890**	**420**	**51 J**	**340**	**25**	**26**	**180**	**19**	**3300**	**26**
NAPHTHALENE	91-20-3	2000	160	54000	---	---	**700 J**	**320 J**	75 U	**210**	64 U	62 U	**73**	51 U	**63**	40 U
PHENANTHRENE	85-01-8	180000	29000	40000	---	---	**3900 J**	**1800 J**	**110 J**	**1100**	**23 J**	62 U	**510**	51 U	**1800**	**20 J**
PYRENE	129-00-0	180000	1100	13000	---	---	**4300 J**	**1700 J**	**92 J**	**1100**	64 U	62 U	**510**	51 U	**6800**	**23 J**
PCBs (µg/kg)																
AROCLOR 1016	12674-11-2	410	--	--	166 U	262 U	18 U	24 U	67 U	56 U	54 U	58 UJ	64 UJ	53 U	21 UJ	31 U
AROCLOR 1221	11104-28-2	200	--	--	166 U	262 U	18 U	24 U	67 U	56 U	54 U	58 UJ	64 UJ	53 U	21 UJ	31 U
AROCLOR 1232	11141-16-5	170	--	--	166 U	262 U	22 U	29 U	79 U	66 U	63 U	68 UJ	76 UJ	62 U	24 UJ	36 U
AROCLOR 1242	53469-21-9	230	--	--	166 U	262 U	18 U	24 U	67 U	56 U	54 U	58 UJ	64 UJ	53 U	21 UJ	31 U
AROCLOR 1248	12672-29-6	230	--	--	166 U	262 U	18 U	24 U	67 U	56 U	54 U	58 UJ	64 UJ	53 U	21 UJ	31 U
AROCLOR 1254	11097-69-1	120	--	--	166 U	262 U	18 U	24 U	67 U	56 U	54 U	58 UJ	64 UJ	53 U	21 UJ	31 U
AROCLOR 1260	11096-82-5	240	20	--	**241**	**97.7 J**	**130 J**	**580 J**	67 U	**230 J**	54 U	58 UJ	64 UJ	53 U	21 UJ	31 U
TOTAL PCBS	1336-36-3	120	20	10000	**241**	**97.7 J**	**130 J**	**580**	67 U	**230 J**	54 U	58 UJ	64 UJ	53 U	21 UJ	31 U
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700	--	--	---	---	**19000**	**24900**	**12500**	**9400**	**4570 J**	**9260 J**	**4910**	**7940**	**9220**	**5390**
ANTIMONY	7440-36-0	3.1	0.27	10	---	---	**0.21**	**0.33**	**0.32 J**	**0.30 J**	0.20 U	**0.54**	**1.16**	**0.14 J**	**0.61**	**0.44**
ARSENIC	7440-38-2	0.68	18	7	**6.5 J**	**8.0 J**	**11.1**	**14.6**	**6.70**	**5.00**	**1.90 J**	**6.94 J**	**13.9**	**2.70**	**15.7**	**8.20**
BARIUM	7440-39-3	1500	330	5500	**18.0**	**17.8**	**18.1**	**24.6**	**14.6**	**9.44**	**5.18 J**	**12.8 J**	**9.50**	**9.69**	**15.5**	**9.32**
BERYLLIUM	7440-41-7	16	10	0.4	---	---	**1.05**	**1.33**	**0.894**	**1.01**	**0.448**	**0.498**	0.560 U	**0.669**	**0.740**	**0.525**
CADMIUM	7440-43-9	7.1	0.36	39	1.6 U	2.2 U	**0.244**	**0.239 J**	**0.094 J**	**0.41 J**	**0.09 J**	**1.72 J**	**0.968**	**0.065 J**	**2.38**	**0.10 J**
CALCIUM	7440-70-2	--	--	--	---	---	**1820**	**2500**	**6650**	**5230**	**7680 J**	**3680 J**	**3620**	**6640**	**1830**	**2420**
CHROMIUM	7440-47-3	12000	0.4	1400/390	**29.0**	**29.0**	**23.8**	**32.7**	**17.8**	**10.9**	**5.91 J**	**22.4 J**	**18.3**	**9.42**	**23.6**	**21.6**
COBALT	7440-48-4	2.3	2.4	--	---	---	**6.32**	**7.35**	**2.70**	**2.82**	**1.18 J**	**4.17 J**	**2.58**	**1.34**	**8.51**	**4.07**
COPPER	7440-50-8	310	28	3100	---	---	**24.5**	**36.2**	**9.72**	**6.78**	**2.80 J**	**28.6 J**	**32.5**	**5.65**	**44.0**	**18.5**
IRON	7439-89-6	5500	--	--	---	---	**20400**	**24800**	**12000**	**10600**	**2800 J**	**10200 J**	**9490**	**5810**	**19300**	**13600**
LEAD	7439-92-1	400	11	150	**175**	**109**	**110 J**	**188 J**	**25.0**	**12.8**	**4.23 J**	**141 J**	**141**	**8.73**	**277**	**41.2**
MAGNESIUM	7439-95-4	--	--	--	---	---	**4880**	**6370**	**9480**	**8020**	**10300**	**7660**	**8090**	**9410**	**3910**	**4640**
MANGANESE	7439-96-5	180	220	390	---	---	**186**	**224**	**142**	**65.9**	**40.6 J**	**89.7 J**	**67.4**	**51.0**	**98.8**	**54.5**
MERCURY	7439-97-6	2.3	0.013	23	**0.124**	**0.130**	**0.069 J**	**0.143**	**0.094 J**	**0.210 J**	**0.033 J**	**0.056 J**	**0.110 J**	**0.051 J**	**0.143**	**0.268**
NICKEL	7440-02-0	150	38	1000	---	---	**15.9**	**19.5**	**9.92**	**10.0**	**4.32 J**	**25.9 J**	**17.0**	**7.59**	**30.4**	**12.3**
POTASSIUM	7440-09-7	--	--	--	---	---	**1560**	**2170**	**2560**	**2260**	**1700 J**	**2610 J**	**2460**	**2190**	**1750**	**1840**
SELENIUM	7782-49-2	39	0.52	390	**4.9 J**	**4.3 J**	**0.61 J**	**0.952 J**	**1.1 J**	**0.73 J**	**0.80 J**	**1.1 J**	**1.0 J**	**0.63 J**	**0.67 J**	**0.70 J**
SILVER	7440-22-4	39	4.2	200	1.6 U	2.2 U	**0.237**	**0.330**	**0.099 J**	**0.038 J**	0.160 U	**0.302 J**	**0.481 J**	**0.043 J**	**0.391**	**0.093 J**
SODIUM	7440-23-5	--	--	--	---	---	**6780**	**9260**	**34400**	**34700**	**37800**	**41600**	**48000**	**37600**	**12300**	**22800**
THALLIUM	7440-28-0	0.078	0.22	5.5	---	---	**0.234**	**0.250**	0.240 U	**0.130 J**	**0.044 J**	**0.220 J**	**0.140 J**	0.210 U	**0.266**	**0.029 J**
VANADIUM	7440-62-2	39	2	550	---	---	**32.2**	**46.4**	**29.7**	**24.3**	**11.0 J**	**46.1 J**	**53.3**	**20.3**	**45.8**	**25.9**
ZINC	7440-66-6	2300	46	6000	---	---	**95.3**	**114**	**32.3**	**26.9**	**6.91 J**	**142 J**	**215**	**15.2**	**256**	**52.4**

Table 5-5
Summary of Hydric Soil Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-6A		SSH-301			SSH-302			SSH-303		SSH-304	
				SAMPLE ID	SSH-6A 0-1	SSH-6A 1-2	SSH-301-CI19-0-1	SSH-301-CI19-0-1-DUP	SSH-301-CI19-1-2	SSH-302-CI19-0-1	SSH-302-CI19-1-2	SSH-302-CI19-1-2-DUP	SSH-303-CI19-0-1	SSH-303-CI19-1-2	SSH-304-CI19-0-1	SSH-304-CI19-1-2
				SAMPLE DATE	29-Nov-11	29-Nov-11	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19
				QC IDENTIFIER			DUPLICATE	DUPLICATE			DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
TOC (mg/kg)																
TOTAL ORGANIC CARBON		--	--	--	**156000**	**224000**	**100000**	**120000**	**320000**	---	---	---	**290000**	**470000**	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 199
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

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Table 5-5
Summary of Hydric Soil Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-305		SSH-306		SSH-307		SSH-308		SSH-309		SSH-310	
				SAMPLE ID	SSH-305-CI19-0-1	SSH-305-CI19-1-2	SSH-306-CI19-0-1	SSH-306-CI19-1-2	SSH-307-CI19-0-1	SSH-307-CI19-1-2	SSH-308-CI19-0-1	SSH-308-CI19-1-2	SSH-309-CI19-0-1	SSH-309-CI19-1-2	SSH-310-CI19-0-1	SSH-310-CI19-1-2
				SAMPLE DATE	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
VOCs (µg/kg)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	70	2200	---	---	---	---	---	---	---	---	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	40	540000	---	---	---	---	---	---	---	---	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	127	--	---	---	---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	320	3600	---	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	140	920000	---	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	40	200	---	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	20000	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	3360	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	90	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	35.2	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	1230	10	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	90	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	400	900	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	280	1900	---	---	---	---	---	---	---	---	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	160	--	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	80	--	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	880	--	---	---	---	---	---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	1000	--	---	---	---	---	---	---	---	---	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
2-HEXANONE	591-78-6	20000	360	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	10	--	---	---	---	---	---	---	---	---	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	443000	--	---	---	---	---	---	---	---	---	---	---	---	---
ACETONE	67-64-1	6100000	1200	7800000	---	---	---	---	---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	120	2500	---	---	---	---	---	---	---	---	---	---	---	---
BROMOBENZENE	108-86-1	29000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	540	10000	---	---	---	---	---	---	---	---	---	---	---	---
BROMOFORM	75-25-2	19000	70	81000	---	---	---	---	---	---	---	---	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	5	--	---	---	---	---	---	---	---	---	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	50	1500	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROBENZENE	108-90-7	28000	2400	210000	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROETHANE	75-00-3	1400000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROFORM	67-66-3	320	50	1200	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROMETHANE	74-87-3	11000	10400	--	---	---	---	---	---	---	---	---	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	40	630000	---	---	---	---	---	---	---	---	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	398	--	---	---	---	---	---	---	---	---	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	---	---	---	---	---	---	---	---	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	65000	--	---	---	---	---	---	---	---	---	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	39500	--	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	270	71000	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBUTADIENE	87-68-3	1200	9	--	---	---	---	---	---	---	---	---	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	40	--	---	---	---	---	---	---	---	---	---	---	---	---
METHYL BROMIDE	74-83-9	--	--	800	---	---	---	---	---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	---	---	---	---	---	---	---	---	---	---	---	---
METHYLENE CHLORIDE	75-09-2	35000	210	45000	---	---	---	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	3800	20000	--	---	---	---	---	---	---	---	---	---	---	---	---
N-BUTYL BENZENE	104-51-8	390000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
STYRENE	100-42-5	600000	1200	13000	---	---	---	---	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	60	12000	---	---	---	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	490000	10	190000	---	---	---	---	---	---	---	---	---	---	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	40	1100000	---	---	---	---	---	---	---	---	---	---	---	---

Table 5-5
Summary of Hydric Soil Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-305		SSH-306		SSH-307		SSH-308		SSH-309		SSH-310	
				SAMPLE ID	SSH-305-CI19-0-1	SSH-305-CI19-1-2	SSH-306-CI19-0-1	SSH-306-CI19-1-2	SSH-307-CI19-0-1	SSH-307-CI19-1-2	SSH-308-CI19-0-1	SSH-308-CI19-1-2	SSH-309-CI19-0-1	SSH-309-CI19-1-2	SSH-310-CI19-0-1	SSH-310-CI19-1-2
				SAMPLE DATE	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
VOCs (µg/kg)																
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	398	--	---	---	---	---	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	60	13000	---	---	---	---	---	---	---	---	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	16400	--	---	---	---	---	---	---	---	---	---	---	---	---
VINYL CHLORIDE	75-01-4	59	30	20	---	---	---	---	---	---	---	---	---	---	---	---
XYLENE O	95-47-6	65000	100	--	---	---	---	---	---	---	---	---	---	---	---	---
XYLENE P,M	179601-23-1	--	100	--	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL XYLENES	1330-20-7	58000	--	110000	---	---	---	---	---	---	---	---	---	---	---	---
SVOC (µg/kg)																
1,2,4-TRICHLOROBENZENE	120-82-1	5800	270	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
1,2-DICHLOROBENZENE	95-50-1	180000	90	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
1,3-DICHLOROBENZENE	541-73-1	--	80	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
1,4-DICHLOROBENZENE	106-46-7	2600	880	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000	--	--	1100 UJ	1200 UJ	690 UJ	900 UJ	560 UJ	940 UJ	700 UJ	730 UJ	1000 UJ	320 U	440 U	740 U
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	--	2700 U	3000 U	1700 U	2200 U	1400 U	2300 U	1700 U	1800 U	2500 U	810 U	1100 U	1800 U
2,4,6-TRICHLOROPHENOL	88-06-2	6300	4000	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 U	320 U	440 U	740 U
2,4-DICHLOROPHENOL	120-83-2	19000	10	30000	**1100**	**1200**	**690**	**900**	**560**	**940**	**700**	**730**	1000 U	320 U	440 U	740 U
2,4-DIMETHYLPHENOL	105-67-9	130000	400000	--	1100 UJ	1200 UJ	690 UJ	900 UJ	560 UJ	940 UJ	700 UJ	730 UJ	1000 UJ	320 U	440 U	740 U
2,4-DINITROPHENOL	51-28-5	13000	61	--	2700 UJ	3000 UJ	1700 UJ	2200 UJ	1400 UJ	2300 UJ	1700 UJ	1800 UJ	2500 U	810 U	1100 U	1800 U
2,4-DINITROTOLUENE	121-14-2	1700	6000	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
2,6-DINITROTOLUENE	606-20-2	360	4000	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
2-CHLOROPHENOL	95-57-8	39000	60	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 U	320 U	440 U	740 U
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	100	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 U	320 U	440 U	740 U
2-NITROANILINE	88-74-4	63000	20	--	2700 UJ	3000 UJ	1700 UJ	2200 UJ	1400 UJ	2300 UJ	1700 UJ	1800 UJ	2500 UJ	810 U	1100 U	1800 U
2-NITROPHENOL	88-75-5	--	1600	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 U	320 U	440 U	740 U
3,3'-DICHLOROBENZIDINE	91-94-1	1200	30	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 UJ	---	320 U	440 U	740 U
3-NITROANILINE	99-09-2	--	3160	--	2700 U	3000 U	1700 U	2200 U	1400 U	2300 U	1700 U	1800 U	2500 UJ	810 U	1100 U	1800 U
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	144	--	2700 U	3000 U	1700 U	2200 U	1400 U	2300 U	1700 U	1800 U	2500 U	810 U	1100 U	1800 U
4-BROMOPHENYL PHENYL ETHER	101-55-3	--	--	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
4-CHLORO-3-METHYLPHENOL	59-50-7	630000	--	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 U	320 U	440 U	740 U
4-CHLOROANILINE	106-47-8	2700	1000	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 UJ	1000 UJ	320 U	440 U	740 U
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	--	--	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
4-NITROANILINE	100-01-6	25000	21900	--	2700 U	3000 U	1700 U	2200 U	1400 U	2300 U	1700 U	1800 U	2500 UJ	810 U	1100 U	1800 U
4-NITROPHENOL	100-02-7	--	5120	--	2700 U	3000 U	1700 U	2200 U	1400 U	2300 U	1700 U	1800 U	2500 U	810 U	1100 U	1800 U
BENZOIC ACID	65-85-0	25000000	10	--	2700 UJ	3000 UJ	1700 UJ	2200 UJ	1400 UJ	2300 UJ	1700 UJ	1800 UJ	2500 UJ	810 U	1100 U	1800 U
BENZYL ALCOHOL	100-51-6	630000	2	--	2200 U	2400 U	1400 U	1800 U	1100 U	1900 U	1400 U	1400 U	2000 UJ	650 U	870 U	1500 U
BENZYL BUTYL PHTHALATE	85-68-7	290000	590	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000	--	--	1100 UJ	1200 UJ	690 UJ	900 UJ	560 UJ	940 UJ	700 UJ	730 UJ	1000 UJ	320 U	440 U	740 U
BIS(2-CHLOROETHYL) ETHER (2-CHLOROET	111-44-4	230	--	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	--	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
CARBAZOLE	86-74-8	--	70	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
CRESOLS, M- & P-		--	--	--	1100 UJ	1200 UJ	690 UJ	900 UJ	560 UJ	940 UJ	700 UJ	730 UJ	1000 U	320 U	440 U	740 U
DIBENZOFURAN	132-64-9	7300	150	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
DIETHYL PHTHALATE	84-66-2	5100000	250	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
DIMETHYL PHTHALATE	131-11-3	--	100000	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
DI-N-BUTYL PHTHALATE	84-74-2	630000	11	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
DI-N-OCTYL PHTHALATE	117-84-0	63000	200000	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
HEXACHLOROBENZENE	118-74-1	210	79	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
HEXACHLOROETHANE	67-72-1	1800	24	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
ISOPHORONE	78-59-1	570000	139000	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
NITROBENZENE	98-95-3	5100	2200	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
N-NITROSODIMETHYLAMINE	62-75-9	2	0.0321	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	544	--	1100 UJ	1200 UJ	690 UJ	900 UJ	560 UJ	940 UJ	700 UJ	730 UJ	1000 UJ	320 U	440 U	740 U
N-NITROSODIPHENYLAMINE	86-30-6	110000	545	--	1100 U	1200 U	690 U	900 U	560 U	940 U	700 U	730 U	1000 UJ	320 U	440 U	740 U
PENTACHLOROPHENOL	87-86-5	1000	2100	--	2700 U	3000 U	1700 U	2200 U	1400 U	2300 U	1700 U	1800 U	2500 U	810 U	1100 U	1800 U
PHENOL	108-95-2	1900000	30000	--	1100 UJ	1200 UJ	690 UJ	900 UJ	560 UJ	940 UJ	700 UJ	730 UJ	1000 U	320 U	440 U	740 U

Table 5-5
Summary of Hydric Soil Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-305		SSH-306		SSH-307		SSH-308		SSH-309		SSH-310	
				SAMPLE ID	SSH-305-CI19-0-1	SSH-305-CI19-1-2	SSH-306-CI19-0-1	SSH-306-CI19-1-2	SSH-307-CI19-0-1	SSH-307-CI19-1-2	SSH-308-CI19-0-1	SSH-308-CI19-1-2	SSH-309-CI19-0-1	SSH-309-CI19-1-2	SSH-310-CI19-0-1	SSH-310-CI19-1-2
				SAMPLE DATE	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
PAHs (µg/kg)																
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	**52 J**	48 U	**8.7 J**	36 U	**41 J**	38 U	28 U	29 U	41 U	13 U	**6.4 J**	30 U
2-METHYLNAPHTHALENE	91-57-6	24000	110	123000	**51**	48 U	**11**	36 U	**40**	38 U	**28**	29 U	41 U	13 U	**6.8 J**	30 U
ACENAPHTHENE	83-32-9	360000	250	43000	**44**	48 U	**28**	36 U	**22**	38 U	**28**	29 U	41 U	13 U	**13 J**	30 U
ACENAPHTHYLENE	208-96-8	360000	340	23000	**13**	48 U	**28**	36 U	**22**	38 U	**28**	---	41 UJ	13 U	18 U	30 U
ANTHRACENE	120-12-7	1800000	1.5	35000	**32**	**48**	**11**	**36**	**22**	**38**	**4.3**	**29**	41 UJ	**4.7**	**27 J**	**30**
BENZO(A)ANTHRACENE	56-55-3	1100	1100	900	**230**	97 U	**67**	36 U	**140**	76 U	**56**	29 UJ	41 U	13 U	**93**	59 U
BENZO(A)PYRENE	50-32-8	110	1100	400	**350**	**18 J**	**87**	36 **U**	**220**	**19 J**	**40**	29 UJ	**32 J**	**5.5 J**	**96**	**13 J**
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	900	**490**	**35 J**	**160**	**21 J**	**290**	**35 J**	**65**	29 UJ	**65 J**	13 U	**130**	**17 J**
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	800	**230**	48 U	**51**	36 U	**140**	38 U	**15**	29 UJ	41 UJ	**12 J**	**53**	**7.7 J**
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	900	**150**	48 U	**54**	36 U	**98**	**13 J**	**27**	29 UJ	**23 J**	13 U	**53**	**11 J**
CHRYSENE	218-01-9	110000	1100	400	**440**	97 U	**100**	36 U	**280**	76 U	**56**	29 UJ	41 U	13 U	**110**	30 U
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	400	**66**	48 **U**	**17**	36 U	**38**	38 U	**28**	29 UJ	41 UJ	**9.9 J**	**18 J**	**6.2 J**
FLUORANTHENE	206-44-0	240000	29000	20000	**520**	97 U	**170**	72 U	**290**	76 U	**67**	29 UJ	83 U	26 U	**200**	59 U
FLUORENE	86-73-7	240000	30000	28000	**40**	48 U	**28**	36 U	**29**	38 U	**28**	29 U	41 U	13 U	**16 J**	30 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	900	**230**	**16**	**64**	**11**	**140**	**16**	**37**	**29**	83 UJ	**13**	**71**	**30**
NAPHTHALENE	91-20-3	2000	160	54000	**91**	48 U	**28**	36 U	**77**	38 U	**28**	29 U	41 U	13 U	**11 J**	30 U
PHENANTHRENE	85-01-8	180000	29000	40000	**530**	**17 J**	**100**	**9.2 J**	**400**	**14 J**	**30**	29 UJ	**32 J**	**5.1 J**	**160**	30 U
PYRENE	129-00-0	180000	1100	13000	**730**	48 U	**130**	36 U	**510**	38 U	**53**	29 UJ	**38 J**	13 U	**240**	30 U
PCBs (µg/kg)																
AROCLOR 1016	12674-11-2	410	--	--	40 U	40 UJ	20 U	34 U	21 U	32 U	22 UJ	26 UJ	34 UJ	11 UJ	15 U	22 U
AROCLOR 1221	11104-28-2	200	--	--	40 U	40 UJ	20 U	34 U	21 U	32 U	22 UJ	26 UJ	34 UJ	11 UJ	15 U	22 U
AROCLOR 1232	11141-16-5	170	--	--	47 U	48 UJ	24 U	40 U	25 U	37 U	26 UJ	30 UJ	41 UJ	13 UJ	18 U	26 U
AROCLOR 1242	53469-21-9	230	--	--	40 U	40 UJ	20 U	34 U	21 U	32 U	22 UJ	26 UJ	34 UJ	11 UJ	15 U	22 U
AROCLOR 1248	12672-29-6	230	--	--	40 U	40 UJ	20 U	34 U	21 U	32 U	22 UJ	26 UJ	34 UJ	11 UJ	15 U	22 U
AROCLOR 1254	11097-69-1	120	--	--	40 U	40 UJ	20 U	34 U	21 U	32 U	22 UJ	26 UJ	34 UJ	11 UJ	15 U	22 U
AROCLOR 1260	11096-82-5	240	20	--	**130 J**	40 UJ	20 U	34 U	**110**	32 U	22 UJ	26 UJ	34 UJ	11 UJ	**39.0**	22 U
TOTAL PCBS	1336-36-3	120	20	10000	**130 J**	40 UJ	20 U	34 U	**110 J**	32 U	22 UJ	26 UJ	34 UJ	11 UJ	**39.0 J**	22 U
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700	--	--	**7720**	**10500**	**8390**	**8210**	**10300**	**8490**	**9500**	**12400**	**8170**	**1690**	**4800**	**5700**
ANTIMONY	7440-36-0	3.1	0.27	10	**0.40 J**	**0.25 J**	**0.24**	**0.21 J**	**0.41**	**0.52**	**0.29**	**0.10 J**	**0.47 J**	**0.02 J**	**0.099 J**	**0.12 J**
ARSENIC	7440-38-2	0.68	18	7	**10.2**	**4.00**	**5.26**	**4.58**	**9.65**	**13.3**	**8.67**	**4.09**	**16.3**	**0.64**	**2.37**	**7.20**
BARIUM	7440-39-3	1500	330	5500	**13.6**	**13.1**	**13.0**	**8.49**	**10.9**	**15.3**	**16.1**	**19.5 J**	**12.3**	**3.39**	**7.16**	**8.82**
BERYLLIUM	7440-41-7	16	10	0.4	0.450 U	**0.917**	**0.538**	**0.841**	**0.908**	**0.750**	**0.889**	**1.14**	**0.669**	**0.0764**	**0.434**	**0.438**
CADMIUM	7440-43-9	7.1	0.36	39	**0.16 J**	**0.17 J**	**0.13 J**	**0.195 J**	**0.455**	**0.745**	**0.255**	**0.051 J**	**0.058 J**	**0.017 J**	**0.066 J**	**0.069 J**
CALCIUM	7440-70-2	--	--	--	**3200**	**4940**	**2200**	**4160**	**1730**	**2600**	**2290**	**3020**	**3040**	**562**	**1410**	**1820**
CHROMIUM	7440-47-3	12000	0.4	1400/390	**23.2**	**13.2**	**19.7**	**9.16**	**12.3**	**25.5**	**33.4**	**21.3**	**20.9**	**2.36**	**10.1**	**10.8**
COBALT	7440-48-4	2.3	2.4	--	**2.46**	**2.87**	**2.65**	**2.26**	**3.94**	**4.79**	**4.03**	**3.52**	**2.43**	**0.296**	**1.54**	**2.27**
COPPER	7440-50-8	310	28	3100	**30.3**	**6.36**	**24.2**	**5.12**	**18.6**	**23.8**	**22.7**	**5.98**	**19.0**	**0.45**	**10.8**	**5.14**
IRON	7439-89-6	5500	--	--	**11600**	**7570**	**8920**	**8540**	**16500**	**18700**	**16800**	**9510 J**	**15300**	**2590**	**5050**	**7190**
LEAD	7439-92-1	400	11	150	**50.5**	**24.1**	**89.4**	**12.6**	**49.6**	**50.8**	**76.7**	**10.0 J**	**46.6 J**	**1.77**	**23.5**	**12.4**
MAGNESIUM	7439-95-4	--	--	--	**7180**	**7850**	**4120**	**6160**	**3060**	**4080**	**5100**	**6240**	**5760**	**778**	**2150**	**3920**
MANGANESE	7439-96-5	180	220	390	**92.8**	**67.2**	**84.2**	**57.1**	**98.5**	**92.2**	**106**	**94.7**	**85.6**	**16.3**	**64.9**	**60.9**
MERCURY	7439-97-6	2.3	0.013	23	**0.100 J**	0.092 U	**0.143**	0.075 U	**0.129**	**0.120 J**	**0.147**	**0.043 J**	**0.160**	0.020 U	**0.076**	0.041 U
NICKEL	7440-02-0	150	38	1000	**12.2**	**13.6**	**10.7**	**7.99**	**18.7**	**16.9**	**13.2**	**11.1**	**10.4**	**0.584**	**5.18**	**7.35**
POTASSIUM	7440-09-7	--	--	--	**2520**	**2440**	**1810**	**1830**	**1300**	**1940**	**2370**	**2630**	**2220**	**381**	**1040**	**1590**
SELENIUM	7782-49-2	39	0.52	390	**0.85 J**	**0.74 J**	**0.66 J**	**0.60 J**	**0.42 J**	**0.85 J**	**0.69 J**	**0.54 J**	**1.0 J**	**0.08 J**	**0.19 J**	**0.30 J**
SILVER	7440-22-4	39	4.2	200	**0.359 J**	**0.040 J**	**0.238**	**0.044 J**	**0.185**	**0.200 J**	**0.130 J**	**0.035 J**	**0.099 J**	**0.0074 J**	**0.115 J**	**0.031 J**
SODIUM	7440-23-5	--	--	--	**38800**	**35600**	**15400**	**27400**	**9770**	**10200**	**16400**	**17200**	**25600**	**3700**	**6600**	**16200**
THALLIUM	7440-28-0	0.078	0.22	5.5	**0.140 J**	**0.130 J**	**0.077 J**	**0.085 J**	**0.110 J**	0.320 U	0.240 U	**0.120 J**	0.300 U	0.065 U	0.130 U	0.260 U
VANADIUM	7440-62-2	39	2	550	**42.7**	**29.3**	**34.9**	**21.2**	**20.5**	**45.9**	**31.9**	**41.9**	**34.8**	**6.12**	**13.8**	**20.7**
ZINC	7440-66-6	2300	46	6000	**49.4**	**33.1**	**39.3**	**22.9**	**108**	**116**	**67.6**	**39.3**	**38.9**	**4.24**	**24.5**	**23.1**

Table 5-5
Summary of Hydric Soil Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-305		SSH-306		SSH-307		SSH-308		SSH-309		SSH-310	
				SAMPLE ID	SSH-305-CI19-0-1	SSH-305-CI19-1-2	SSH-306-CI19-0-1	SSH-306-CI19-1-2	SSH-307-CI19-0-1	SSH-307-CI19-1-2	SSH-308-CI19-0-1	SSH-308-CI19-1-2	SSH-309-CI19-0-1	SSH-309-CI19-1-2	SSH-310-CI19-0-1	SSH-310-CI19-1-2
				SAMPLE DATE	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19	04-Oct-19
				QC IDENTIFIER												
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
TOC (mg/kg)																
TOTAL ORGANIC CARBON		--	--	--	**280000**	**300000**	**---**	**---**	**120000**	**200000**	**---**	**---**	**130000**	**16000**	**---**	**---**

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 199
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

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Table 5-6
Summary of Hydric Soil Analytical Data - Off-Site Background
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION					SSH-311			SSH-312		SSH-313		SSH-314		SSH-315	
SAMPLE ID					SSH-311-CI20-0-1	SSH-311-CI20-0-1-DUP	SSH-311-CI20-1-2	SSH-312-CI20-0-1	SSH-312-CI20-1-2	SSH-313-CI20-0-1	SSH-313-CI20-1-2	SSH-314-CI20-0-1	SSH-314-CI20-1-2	SSH-315-CI20-0-1	SSH-315-CI20-1-2
SAMPLE DATE					22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20
QC IDENTIFIER															
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**											
METALS (mg/kg)															
ALUMINUM	7429-90-5	7700	--	--	**9760**	**11000**	**9890**	**7540**	**4110**	**8510**	**8100**	**5950**	**10800**	**6720**	**5440**
ANTIMONY	7440-36-0	3.1	0.27	10	0.110 U	**0.13**	0.130 U	0.120 U	0.055 U	**0.583**	**0.779**	0.260 U	0.210 U	0.200 U	0.180 U
ARSENIC	7440-38-2	0.68	18	7	**3.15**	**3.55**	**3.55**	**2.54**	**1.10**	**9.27**	**12.5**	**1.8**	**3.0**	**2.0**	**1.7**
BARIUM	7440-39-3	1500	330	5500	**9.38**	**11.4**	**10.4**	**7.90**	**36.8**	**9.06**	**9.21**	**6.75**	**12.7**	**7.72**	**6.26**
BERYLLIUM	7440-41-7	16	10	0.4	**0.628**	**0.750**	**0.703**	**0.534**	**0.307**	**0.608**	**0.592**	**0.518**	**0.756**	**0.539**	**0.406**
CADMIUM	7440-43-9	7.1	0.36	39	0.110 U	0.130 U U	0.130 U	0.120 U	0.110 U	0.110 U	0.110 U	0.260 U	0.210 U	0.200 U	0.180 U
CALCIUM	7440-70-2	--	--	--	**753**	**902**	**783**	**612**	**320**	**809**	**668**	**1590**	**1470**	**1140**	**986**
CHROMIUM	7440-47-3	12000	0.4	1400/390	**10.6**	**12.3**	**11.1**	**9.22**	**5.20**	**20.2**	**22.9**	**8.38**	**12.2**	**8.93**	**7.58**
COBALT	7440-48-4	2.3	2.4	--	**2.66**	**2.68**	**2.55**	**2.22**	**1.62**	**4.46**	**5.00**	**1.79**	**2.51**	**1.91**	**1.60**
COPPER	7440-50-8	310	28	3100	**6.75**	**8.16**	**17.0**	**5.43**	**2.73**	**40.0**	**50.8**	**8.45**	**9.24**	**6.40**	**6.94**
IRON	7439-89-6	5500	--	--	**10500**	**11600**	**10700**	**8740**	**6400**	**52000**	**62900**	**5950**	**8920**	**6950**	**5220**
LEAD	7439-92-1	400	11	150	**34.6**	**42.5**	**42.4**	**25.1**	**4.86**	**23.0**	**21.0**	**38.3**	**51.8**	**31.7**	**31.8**
MAGNESIUM	7439-95-4	--	--	--	**2060**	**2350**	**2120**	**1890**	**1450**	**1790**	**1780**	**1510**	**2060**	**1680**	**1370**
MANGANESE	7439-96-5	180	220	390	**81.7**	**89.1**	**83.0**	**70.3**	**54.4**	**176**	**200**	**62.1**	**95.4**	**75.4**	**57.9**
MERCURY	7439-97-6	2.3	0.013	23	**0.0480 J**	**0.053**	**0.049**	**0.047**	**0.0150 J**	**0.056**	**0.062**	**0.083**	**0.0560 J**	**0.0320 J**	**0.0300**
NICKEL	7440-02-0	150	38	1000	**6.66**	**7.55**	**6.82**	**5.59**	**3.91**	**15.5**	**17.2**	**4.44**	**7.26**	**5.34**	**4.62**
POTASSIUM	7440-09-7	--	--	--	**896**	**969**	**938**	**753**	**630**	**751**	**1000**	**605**	**866**	**683**	**564**
SELENIUM	7782-49-2	39	0.52	390	**0.300 J**	**0.360 J**	**0.320 J**	**0.220 J**	**0.0750 J**	**0.260 J**	**0.240 J**	**0.330 J**	**0.340 J**	**0.240 J**	**0.220 J**
SILVER	7440-22-4	39	4.2	200	**0.0420 J**	**0.0530 J**	**0.0480 J**	**0.0320 J**	**0.00770 J**	**0.0330 J**	**0.0320 J**	**0.0620 J**	**0.060 J**	**0.0430 J**	**0.0440 J**
SODIUM	7440-23-5	--	--	--	110 U	130 U U	130 U	120 U	110 U	110 U	110 U	260 U	210 U	200 U	180 U
THALLIUM	7440-28-0	0.078	0.22	5.5	**0.133**	**0.162**	**0.132**	0.120 U	0.110 U	**0.117**	**0.128**	0.260 U	0.210 U	0.200 U	0.180 U
VANADIUM	7440-62-2	39	2	550	**18.5**	**21.7**	**20.1**	**15.5**	**7.48**	**16.7**	**16.6**	**13.2**	**24.0**	**16.4**	**12.6**
ZINC	7440-66-6	2300	46	6000	**29.2**	**33.2**	**31.8**	**25.0**	**18.0**	**28.0**	**35.5**	**29.3**	**40.7**	**31.0**	**25.0**
PAHs (µg/kg)															
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	13.0 U	14.0 U	15.0 U	14.0 U	13.0 U	15.0 U	13.0 U	28.0 U	22.0 U	**4.00 J**	20.0 U
2-METHYLNAPHTHALENE	91-57-6	24000	110	110000	13.0 U	14.0 U	15.0 U	14.0 U	13.0 U	15.0 U	13.0 U	28.0 U	22.0 U	**4.80 J**	20.0 U
ACENAPHTHENE	83-32-9	360000	250	250000	13.0 U	14.0 U	15.0 U	14.0 U	13.0 U	15.0 U	13.0 U	28.0 U	22.0 U	22.0 U	20.0 U
ACENAPHTHYLENE	208-96-8	360000	340	340000	13.0 U	14.0 U	15.0 U	14.0 U	13.0 U	15.0 U	13.0 U	28.0 U	**5.50 J**	**11.0 J**	**5.20 J**
ANTHRACENE	120-12-7	1800000	1.5	1500	**3.90 J**	**2.10 J**	**2.10 J**	**2.20 J**	13.0 U	**2.40 J**	**2.10 J**	**15.0 J**	**11.0 J**	**25.0 J**	**6.70 J**
BENZO(A)ANTHRACENE	56-55-3	1100	1100	1100000	**23.0 J**	**12.0 J**	**13.0 J**	**18.0 J**	**13.0** UJ	**16.0 J**	**11.0 J**	**110**	**70.0**	**170**	**50.0**
BENZO(A)PYRENE	50-32-8	110	1100	1100000	**26.0 J**	**18.0 J**	**18.0 J**	**21.0 J**	13.0 U	**19.0 J**	**14.0 J**	**130**	**95.0**	**220**	**67.0**
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	1100000	**36**	**28.0 J**	**28.0 J**	**45.0**	13.0 U	**33.0**	**20.0 J**	**400**	**240**	**950**	**150**
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	1100000	**19.0 J**	**16.0 J**	**18.0 J**	**19.0 J**	13.0 U	**19.0 J**	**13.0 J**	**140**	**93.0**	**220**	**61.0**
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	1100000	**15.0 J**	**11.0 J**	**12.0 J**	**16.0 J**	13.0 U	**13.0 J**	**9.10 J**	**140**	**69.0**	**260**	**51.0**
CHRYSENE	218-01-9	110000	1100	1100000	**33**	**22.0 J**	**22.0 J**	**32.0**	13.0 U	**32.0**	**15.0 J**	**380**	**180**	**970**	**120**
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	60000	**3.90 J**	14.0 U	15.0 U	**5.60 J**	13.0 U	15.0 U	**3.10 J**	**32.0 J**	**22.0 J**	**54.0**	**16.0 J**
FLUORANTHENE	206-44-0	240000	29000	29000000	**63**	**42**	**39**	**44.0**	13.0 U	**37.0**	**28.0**	**530**	**300**	**1700**	**190**
FLUORENE	86-73-7	240000	30000	30000000	13.0 U	14.0 U	15.0 U	14.0 U	13.0 U	15.0 U	13.0 U	28.0 U	22.0 U	**10.0 J**	20.0 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	1100000	**16.0 J**	**13.0 J**	**15.0 J**	**17.0 J**	13.0 U	**15.0 J**	**10.0 J**	**120**	**85.0**	**240**	**54.0**
NAPHTHALENE	91-20-3	2000	160	160000	**4.80 J**	14.0 U	15.0 U	14.0 U	13.0 U	**4.10 J**	13.0 U	**8.00 J**	**7.80 J**	**7.40 J**	**7.20 J**
PHENANTHRENE	85-01-8	180000	29000	29000000	**24.0 J**	**18.0 J**	**18.0 J**	**17.0 J**	13.0 U	**19.0 J**	**16.0 J**	**160**	**92.0**	**400**	**61.0**
PYRENE	129-00-0	180000	1100	1100000	**63**	**41**	**41**	**41.0**	13.0 U	**49.0**	**31.0**	**540**	**280**	**1400**	**180**

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Table 5-6
Summary of Hydric Soil Analytical Data - Off-Site Background
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-311			SSH-312		SSH-313		SSH-314		SSH-315	
				SAMPLE ID	SSH-311-CI20-0-1	SSH-311-CI20-0-1-DUP	SSH-311-CI20-1-2	SSH-312-CI20-0-1	SSH-312-CI20-1-2	SSH-313-CI20-0-1	SSH-313-CI20-1-2	SSH-314-CI20-0-1	SSH-314-CI20-1-2	SSH-315-CI20-0-1	SSH-315-CI20-1-2
				SAMPLE DATE	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20
				QC IDENTIFIER											
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**											
PCBs (µg/kg)															
AROCLOR 1016	12674-11-2	410	--	--	12.0 U	12.0 U	12.0 U	10.0 U	11.0 U	11.0 U	11.0 U	23.0 U	18.0 U	16.0 U	15.0 UJ
AROCLOR 1221	11104-28-2	200	--	--	12.0 U	12.0 U	12.0 U	10.0 U	11.0 U	11.0 U	11.0 U	23.0 U	18.0 U	16.0 U	15.0 UJ
AROCLOR 1232	11141-16-5	170	--	--	14.0 U	14.0 U	14.0 U	12.0 U	13.0 U	13.0 U	13.0 U	27.0 U	21.0 U	19.0 U	17.0 UJ
AROCLOR 1242	53469-21-9	230	--	--	12.0 U	12.0 U	12.0 U	10.0 U	11.0 U	11.0 U	11.0 U	23.0 U	18.0 U	16.0 U	15.0 UJ
AROCLOR 1248	12672-29-6	230	--	--	12.0 U	12.0 U	12.0 U	10.0 U	11.0 U	11.0 U	11.0 U	23.0 U	18.0 U	16.0 U	15.0 UJ
AROCLOR 1254	11097-69-1	120	--	--	12.0 U	12.0 U	12.0 U	10.0 U	11.0 U	11.0 U	11.0 U	23.0 U	18.0 U	16.0 U	15.0 UJ
AROCLOR 1260	11096-82-5	240	20	--	12.0 U	12.0 U	12.0 U	10.0 U	11.0 U	11.0 U	11.0 U	23.0 U	18.0 U	16.0 U	15.0 UJ
TOTAL PCBS	1336-36-3	120	20	10000	84.0 U	87.0 U	88.0 U	75.0 U	77.0 U	79.0 U	81.0 U	160 U	130 U	120 U	**110** UJ
TOC (mg/kg)															
TOTAL ORGANIC CARBON		--	--	--	**25000 J**	**43000 J**	**41000 J**	---	---	**40000 J**	**26000 J**	---	---	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 1997)
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

Table 5-6
Summary of Hydric Soil Analytical Data - Off-Site Background
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-316		SSH-317		SSH-318		SSH-319		SSH-320	
				SAMPLE ID	SSH-316-CI20-0-1	SSH-316-CI20-1-2	SSH-317-CI20-0-1	SSH-317-CI20-1-2	SSH-318-CI20-0-1	SSH-318-CI20-1-2	SSH-319-CI20-0-1	SSH-319-CI20-1-2	SSH-320-CI20-0-1	SSH-320-CI20-1-2
				SAMPLE DATE	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20
				QC IDENTIFIER										
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**										
METALS (mg/kg)														
ALUMINUM	7429-90-5	7700	--	--	**5510**	**3210**	**5280**	**5370**	**3880**	**4890**	**6100**	**4210**	**8310**	**4950**
ANTIMONY	7440-36-0	3.1	0.27	10	**0.160** UJ	0.0810 U	0.120 U	0.120 U	0.150 U	0.170 U	**0.16**	0.140 U	0.240 U	0.120 U
ARSENIC	7440-38-2	0.68	18	7	**1.7**	**0.66**	**1.6**	**1.5**	**1.0**	**1.3**	**1.6**	**1.1**	**2.2**	**1.3**
BARIUM	7440-39-3	1500	330	5500	**5.57**	**5.37**	**5.69**	**6.70**	**4.68**	**6.06**	**7.04**	**5.43**	**8.6**	**6.52**
BERYLLIUM	7440-41-7	16	10	0.4	**0.427**	**0.247**	**0.416**	**0.428**	**0.309**	**0.368**	**0.442**	**0.346**	**0.625**	**0.421**
CADMIUM	7440-43-9	7.1	0.36	39	0.160 U	0.0810 U	0.120 U	0.120 U	0.150 U	0.170 U	0.150 U	0.140 U	0.240 U	0.120 U
CALCIUM	7440-70-2	--	--	--	**626** J	**448**	**696**	**577**	**500**	**558**	**729**	**449**	**1020**	**625**
CHROMIUM	7440-47-3	12000	0.4	1400/390	**7.50**	**4.80**	**8.04**	**7.21**	**5.30**	**6.41**	**8.17**	**6.08**	**11.5**	**6.45**
COBALT	7440-48-4	2.3	2.4	--	**1.94**	**1.45**	**1.75**	**1.71**	**1.34**	**1.51**	**1.83**	**1.90**	**2.51**	**1.81**
COPPER	7440-50-8	310	28	3100	**5.22**	**1.78**	**4.06**	**3.71**	**3.58**	**3.76**	**5.46**	**2.83**	**7.03**	**3.96**
IRON	7439-89-6	5500	--	--	**7240**	**4680**	**6550**	**6090**	**4740**	**5340**	**6320**	**6120**	**8870**	**6180**
LEAD	7439-92-1	400	11	150	**34.3** J	**8.46**	**31.1**	**96.2**	**36.4**	**38.6**	**45.4**	**17.6**	**50.3**	**18.9**
MAGNESIUM	7439-95-4	--	--	--	**1700** J	**1210**	**1590**	**1440**	**1170**	**1320**	**1680**	**1660**	**2360**	**1420**
MANGANESE	7439-96-5	180	220	390	**74.0** J	**64.4**	**72.8**	**74.6**	**55.6**	**63.0**	**69.0**	**71.1**	**90.5**	**71.5**
MERCURY	7439-97-6	2.3	0.013	23	**0.0370** J	**0.00910** J	**0.0330** J	**0.0170** J	**0.0260** J	**0.0220** J	**0.0440** J	**0.0160** J	**0.0560** J	**0.0290** J
NICKEL	7440-02-0	150	38	1000	**5.14**	**3.26**	**4.63**	**4.32**	**3.33**	**3.91**	**4.75**	**4.83**	**6.92**	**4.34**
POTASSIUM	7440-09-7	--	--	--	**585** J	**506**	**539**	**616**	**451**	**463**	**637**	**669**	**980**	**602**
SELENIUM	7782-49-2	39	0.52	390	**0.170** J	**0.0550** J	**0.150** J	**0.150** J	**0.130** J	**0.140** J	**0.220** J	**0.062** J	**0.30** J	**0.10** J
SILVER	7440-22-4	39	4.2	200	**0.0270** J	**0.00970** J	**0.0280** J	**0.0260** J	**0.0220** J	**0.0250** J	**0.0240** J	**0.0150** J	**0.0540** J	**0.0230** J
SODIUM	7440-23-5	--	--	--	160 U	81.0 U	120 U	120 U	150 U	170 U	150 U	140 U	240 U	120 U
THALLIUM	7440-28-0	0.078	0.22	5.5	0.160 U	0.0810 U	0.120 U	0.120 U	0.150 U	0.170 U	0.150 U	0.140 U	0.240 U	0.120 U
VANADIUM	7440-62-2	39	2	550	**13.1**	**6.38**	**12.1**	**9.64**	**8.14**	**9.92**	**12.6**	**8.44**	**17.8**	**9.98**
ZINC	7440-66-6	2300	46	6000	**25.1**	**15.2**	**21.8**	**20.7**	**17.9**	**21.1**	**26.0**	**21.6**	**37.6**	**22.8**
PAHs (µg/kg)														
1-METHYLNAPHTHALENE	90-12-0	18000	140	--	17.0 U	12.0 U	14.0 U	15.0 U	15.0 U	**3.00** J	**3.60** J	14.0 U	26.0 U	13.0 U
2-METHYLNAPHTHALENE	91-57-6	24000	110	110000	17.0 U	12.0 U	14.0 U	15.0 U	15.0 U	18.0 U	**4.40** J	14.0 U	26.0 U	13.0 U
ACENAPHTHENE	83-32-9	360000	250	250000	17.0 U	12.0 U	14.0 U	15.0 U	15.0 U	18.0 U	**3.20** J	14.0 U	26.0 U	13.0 U
ACENAPHTHYLENE	208-96-8	360000	340	340000	**2.60** J	12.0 U	**3.40** J	15.0 U	**3.20** J	**12.0** J	**15.0** J	14.0 U	**11.0** J	13.0 U
ANTHRACENE	120-12-7	1800000	1.5	1500	**3.60** J	12.0 U	**6.40** J	15.0 U	**4.10** J	**21.0** J	**28.0** J	**1.80** J	**23.0** J	13.0 U
BENZO(A)ANTHRACENE	56-55-3	1100	1100	1100000	**26.0** J	12.0 U	**38.0**	15.0 U	**29.0** J	**130**	**230**	**12.0** J	**170**	**7.50** J
BENZO(A)PYRENE	50-32-8	110	1100	1100000	**34.0**	12.0 U	**47.0**	15.0 U	**33.0**	**130**	**260**	**15.0** J	**200**	**9.10** J
BENZO(B)FLUORANTHENE	205-99-2	1100	1100	1100000	**55.0**	12.0 U	**69.0**	15.0 U	**54.0**	**200**	**360**	**22.0** J	**270**	**14.0** J
BENZO(G,H,I)PERYLENE	191-24-2	1800000	1100	1100000	**33.0** J	12.0 U	**36.0**	15.0 U	**26.0** J	**92.0**	**170**	**11.0** J	**140**	**10.0** J
BENZO(K)FLUORANTHENE	207-08-9	11000	1100	1100000	**23.0** J	12.0 U	**27.0** J	15.0 U	**20.0** J	**63.0**	**110**	**9.20** J	**92.0**	**5.60** J
CHRYSENE	218-01-9	110000	1100	1100000	**42.0**	12.0 U	**50.0**	15.0 U	**37.0**	**140**	**240**	**16.0** J	**190**	**12.0** J
DIBENZO(A,H)ANTHRACENE	53-70-3	110	60	60000	**5.90** J	12.0 U	**9.00** J	15.0 U	**5.80** J	**25.0** J	**49.0**	14.0 U	**36.0** J	13.0 U
FLUORANTHENE	206-44-0	240000	29000	29000000	**76.0**	12.0 U	**98.0**	15.0 U	**85.0**	**320**	**420**	**34.0**	**370**	**23.0** J
FLUORENE	86-73-7	240000	30000	30000000	17.0 U	12.0 U	14.0 U	15.0 U	15.0 U	**15.0** J	**16.0** J	14.0 U	**12.0** J	13.0 U
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	1100	1100000	**28.0** J	12.0 U	**32.0**	15.0 U	**25.0** J	**85.0**	**160**	**11.0** J	**130**	**7.50** J
NAPHTHALENE	91-20-3	2000	160	160000	**5.20** J	12.0 U	**5.00** J	15.0 U	15.0 U	**11.0** J	**16.0** J	14.0 U	**16.0** J	13.0 U
PHENANTHRENE	85-01-8	180000	29000	29000000	**34.0** J	12.0 U	**54.0**	15.0 U	**51.0**	**220**	**250**	**15.0** J	**200**	**11.0** J
PYRENE	129-00-0	180000	1100	1100000	**92.0** J	12.0 U	**130**	15.0 U	**98.0**	**410**	**650**	**42.0**	**530**	**27.0**

Table 5-6
Summary of Hydric Soil Analytical Data - Off-Site Background
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SSH-316		SSH-317		SSH-318		SSH-319		SSH-320	
				SAMPLE ID	SSH-316-CI20-0-1	SSH-316-CI20-1-2	SSH-317-CI20-0-1	SSH-317-CI20-1-2	SSH-318-CI20-0-1	SSH-318-CI20-1-2	SSH-319-CI20-0-1	SSH-319-CI20-1-2	SSH-320-CI20-0-1	SSH-320-CI20-1-2
				SAMPLE DATE	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20
				QC IDENTIFIER										
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**										
PCBs (µg/kg)														
AROCLOR 1016	12674-11-2	410	--	--	12.0 U	9.00 U	11.0 U	11.0 U	13.0 U	14.0 U	13.0 U	12.0 U	18.0 U	11.0 U
AROCLOR 1221	11104-28-2	200	--	--	12.0 U	9.00 U	11.0 U	11.0 U	13.0 U	14.0 U	13.0 U	12.0 U	18.0 U	11.0 U
AROCLOR 1232	11141-16-5	170	--	--	14.0 U	11.0 U	13.0 U	13.0 U	15.0 U	16.0 U	15.0 U	14.0 U	21.0 U	13.0 U
AROCLOR 1242	53469-21-9	230	--	--	12.0 U	9.00 U	11.0 U	11.0 U	13.0 U	14.0 U	13.0 U	12.0 U	18.0 U	11.0 U
AROCLOR 1248	12672-29-6	230	--	--	12.0 U	9.00 U	11.0 U	11.0 U	13.0 U	14.0 U	13.0 U	12.0 U	18.0 U	11.0 U
AROCLOR 1254	11097-69-1	120	--	--	12.0 U	9.00 U	11.0 U	11.0 U	13.0 U	14.0 U	13.0 U	12.0 U	18.0 U	11.0 U
AROCLOR 1260	11096-82-5	240	20	--	12.0 U	9.00 U	11.0 U	11.0 U	13.0 U	14.0 U	13.0 U	12.0 U	18.0 U	11.0 U
TOTAL PCBS	1336-36-3	120	20	10000	88.0 U	65.0 U	80.0 U	82.0 U	92.0 U	100 U	94.0 U	88.0 U	130 U	78.0 U
TOC (mg/kg)														
TOTAL ORGANIC CARBON		--	--	--	**42000 J**	**11000 J**	---	---	**18000 J**	**17000 J**	---	---	**100000 J**	**18000** J

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Soil Screening Levels (Eco-SSLs) (USEPA, 2005)
b) Oak Ridge National Laboratory terrestrial plant and invertebrate screening values (Efroymson, et al, 19
c) NOAA Screening Quick Reference Table values (Buchman, 2008)
d) USEPA Region 4 ecological screening values for soil (USEPA, 2018)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

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Table 5-7
Summary of Sediment Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-3A		SED-4A		SED-5A	SED-103-2014	SED-104-2014	SED-105-2014	SED-326	SED-327	SED-328	SED-329
				SAMPLE ID	SED 3A 0-0.5	SED 3AD 0-0.5	SED-4A 0-0.5	SED-4A 0-0.5DUP	SED-5A 0-0.5	SED-103-A-2014	SED-104-A-2014	SED-105-A-2014	SED-326-CI19-0-0.5	SED-327-CI19-0-0.5	SED-328-CI19-0-0.5	SED-329-CI19-0-0.5
				SAMPLE DATE	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	31-Jul-14 / 05-Aug-14	31-Jul-14 / 05-Aug-14	31-Jul-14 / 05-Aug-14	1-Oct-19	1-Oct-19	1-Oct-19	1-Oct-19
				QC IDENTIFIER	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE								
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
VOCs (ug/kg)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	--	2200	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	--	540000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	2.5 U	5.0 U	1.9 U	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	--	3600	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	--	920000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	--	200	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6	--	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	473	96000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	--	10	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	16.5	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	--	900	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	--	1900	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	842	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	460	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7	--	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	--	--	**32.3 J**	**24.0 J**	**8.3 J**	---	31.9 U	**17.5 J**	**42.2 J**	**9.6 J**	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
2-HEXANONE	591-78-6	20000	--	--	52.4 U	48.5 U	75.8 U	---	31.9 U	12.6 U	24.8 U	9.5 U	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	--	--	52.4 U	48.5 U	75.8 U	---	31.9 U	12.6 U	24.8 U	9.5 U	---	---	---	---
ACETONE	67-64-1	6100000	--	7800000	175 U	132 U	**158**	---	31.9 U	**120**	**283**	**61**	---	---	---	---
BENZENE	71-43-2	1200	--	2500	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
BROMOBENZENE	108-86-1	29000	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
BROMOMETHANE	74-83-9	--	--	800	10.5 U	9.7 U	15.2 U	---	6.4 U	5.0 U	9.9 U	3.8 U	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	--	10000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
BROMOFORM	75-25-2	19000	--	81000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	0.851	--	5.2 U	4.8 U	**13.4**	---	3.2 U	5.0 U	**4.2 J**	**2.8 J**	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	--	1500	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
CHLOROBENZENE	108-90-7	28000	--	210000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
CHLOROETHANE	75-00-3	1400000	--	--	10.5 U	9.7 U	15.2 U	---	6.4 U	5.0 U	9.9 U	3.8 U	---	---	---	---
CHLOROFORM	67-66-3	320	--	1200	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
CHLOROMETHANE	74-87-3	11000	--	--	10.5 U	9.7 U	15.2 U	---	6.4 U	5.0 U	9.9 U	3.8 U	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	--	630000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	5.2 U	4.8 U	7.6 U	---	3.2 U	2.5 U	5.0 U	1.9 U	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	--	--	10.5 U	9.7 U	15.2 U	---	6.4 U	5.0 U	9.9 U	3.8 U	---	---	---	---
ETHYLBENZENE	100-41-4	5800	--	71000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
HEXACHLOROBUTADIENE	87-68-3	1200	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	86	--	**3.8 J**	**2.1 J**	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
METHYL BROMIDE	74-83-9	--	--	800	10.5 U	9.7 U	15.2 U	---	6.4 U	5.0 U	9.9 U	3.8 U	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
METHYLENE CHLORIDE	75-09-2	35000	--	45000	26.2 U	24.2 U	37.9 U	---	15.9 U	5.0 U	9.9 U	3.8 U	---	---	---	---
NAPHTHALENE	91-20-3	3800	34.6	54000	**0.0038 J**	**0.0026 J**	0.0076 U	---	0.0032 U	5.0 U	**16.4**	**1.3 J**	---	---	---	---
N-BUTYL BENZENE	104-51-8	390000	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	--	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000	137	--	**10.6**	**6.9**	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
STYRENE	100-42-5	600000	--	13000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000	137	--	**6.5**	**3.8 J**	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	--	12000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---

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Table 5-7
Summary of Sediment Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-3A		SED-4A		SED-5A	SED-103-2014	SED-104-2014	SED-105-2014	SED-326	SED-327	SED-328	SED-329
				SAMPLE ID	SED 3A 0-0.5	SED 3AD 0-0.5	SED-4A 0-0.5	SED-4A 0-0.5DUP	SED-5A 0-0.5	SED-103-A-2014	SED-104-A-2014	SED-105-A-2014	SED-326-CI19-0-0.5	SED-327-CI19-0-0.5	SED-328-CI19-0-0.5	SED-329-CI19-0-0.5
				SAMPLE DATE	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	31-Jul-14 / 05-Aug-14	31-Jul-14 / 05-Aug-14	31-Jul-14 / 05-Aug-14	1-Oct-19	1-Oct-19	1-Oct-19	1-Oct-19
				QC IDENTIFIER	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE								
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
VOCs (ug/kg)																
TOLUENE	108-88-3	490000	1090	190000	5.2 U	4.8 U	**4.0 J**	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	--	1100000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	--	13000	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
VINYL CHLORIDE	75-01-4	59	--	20	10.5 U	9.7 U	15.2 U	---	6.4 U	5.0 U	9.9 U	3.8 U	---	---	---	---
XYLENE O	95-47-6	65000	--	--	5.2 U	4.8 U	7.6 U	---	3.2 U	5.0 U	9.9 U	3.8 U	---	---	---	---
XYLENE P,M	179601-23-1	--	--	--	10.5 U	9.7 U	15.2 U	---	6.4 U	10.1 U	19.8 U	7.6 U	---	---	---	---
SVOC (ug/kg)																
1,2,4-TRICHLOROBENZENE	120-82-1	5800	473	96000	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
1,2-DICHLOROBENZENE	95-50-1	180000	16.5	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
1,3-DICHLOROBENZENE	541-73-1	--	842	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
1,4-DICHLOROBENZENE	106-46-7	2600	460	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000	--	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	330000	---	---	---	---	---	---	---	---	780 U	730 U	700 U	820 U
2,4,6-TRICHLOROPHENOL	88-06-2	6300	213	58000	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
2,4-DICHLOROPHENOL	120-83-2	19000	117	30000	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
2,4-DIMETHYLPHENOL	105-67-9	130000	29	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
2,4-DINITROPHENOL	51-28-5	13000	--	160000	---	---	---	---	---	---	---	---	780 U	730 U	700 U	820 U
2,4-DINITROTOLUENE	121-14-2	1700	41.6	900	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
2,6-DINITROTOLUENE	606-20-2	360	--	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
2-CHLORONAPHTHALENE	91-58-7	480000	--	--	---	---	---	---	---	---	---	---	310 UJ	290 UJ	280 UJ	330 UJ
2-CHLOROPHENOL	95-57-8	39000	31.2	50000	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	--	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
2-NITROANILINE	88-74-4	63000	--	--	---	---	---	---	---	---	---	---	780 U	730 U	700 U	820 U
2-NITROPHENOL	88-75-5	--	--	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
3,3'-DICHLOROBENZIDINE	91-94-1	1200	127	1400	---	---	---	---	---	---	---	---	310 UJ	290 UJ	280 UJ	330 UJ
3-NITROANILINE	99-09-2	--	--	--	---	---	---	---	---	---	---	---	780 U	730 U	700 U	820 U
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	--	--	---	---	---	---	---	---	---	---	780 U	730 U	700 U	820 U
4-BROMOPHENYL PHENYL ETHER	101-55-3	--	1230	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
4-CHLORO-3-METHYLPHENOL	59-50-7	630000	--	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
4-CHLOROANILINE	106-47-8	2700	--	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	--	--	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
4-NITROANILINE	100-01-6	25000	--	--	---	---	---	---	---	---	---	---	780 U	730 U	700 U	820 U
4-NITROPHENOL	100-02-7	--	--	--	---	---	---	---	---	---	---	---	780 U	730 U	700 U	820 U
BENZOIC ACID	65-85-0	25000000	650	--	---	---	---	---	---	---	---	---	780 UJ	730 UJ	700 UJ	820 UJ
BENZYL ALCOHOL	100-51-6	630000	52	--	---	---	---	---	---	---	---	---	620 U	590 U	560 U	660 U
BENZYL BUTYL PHTHALATE	85-68-7	290000	10900	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000	--	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	111-44-4	230	--	600	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	180	46000	---	---	---	---	---	---	---	---	310 U	290 U	**160 J**	330 U
CARBAZOLE	86-74-8	240000	21.2	--	---	---	---	---	---	---	---	---	310 U	290 U	**220 J**	330 U
CRESOLS, M- & P-					---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
DIBENZOFURAN	132-64-9	7300	415	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
DIETHYL PHTHALATE	84-66-2	5100000	218	340000	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
DIMETHYL PHTHALATE	131-11-3	--	--	1900000	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
DI-N-BUTYL PHTHALATE	84-74-2	630000	1160	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
DI-N-OCTYL PHTHALATE	117-84-0	63000	61	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
HEXACHLOROBENZENE	118-74-1	210	20	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
HEXACHLOROETHANE	67-72-1	1800	804	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
ISOPHORONE	78-59-1	570000	--	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
NITROBENZENE	98-95-3	5100	--	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
N-NITROSODIMETHYLAMINE	62-75-9	2	--	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	--	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
N-NITROSODIPHENYLAMINE	86-30-6	110000	2680	--	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U
PENTACHLOROPHENOL	87-86-5	1000	504	5300	---	---	---	---	---	---	---	---	780 U	730 U	700 U	820 U
PHENOL	108-95-2	1900000	420	6000000	---	---	---	---	---	---	---	---	310 U	290 U	280 U	330 U

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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-3A		SED-4A		SED-5A	SED-103-2014	SED-104-2014	SED-105-2014	SED-326	SED-327	SED-328	SED-329
				SAMPLE ID	SED 3A 0-0.5	SED 3AD 0-0.5	SED-4A 0-0.5	SED-4A 0-0.5DUP	SED-5A 0-0.5	SED-103-A-2014	SED-104-A-2014	SED-105-A-2014	SED-326-CI19-0-0.5	SED-327-CI19-0-0.5	SED-328-CI19-0-0.5	SED-329-CI19-0-0.5
				SAMPLE DATE	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	31-Jul-14 / 05-Aug-14	31-Jul-14 / 05-Aug-14	31-Jul-14 / 05-Aug-14	1-Oct-19	1-Oct-19	1-Oct-19	1-Oct-19
				QC IDENTIFIER	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE								
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
PAHs (µg/kg)																
1-METHYLNAPHTHALENE	90-12-0	18000	21	--	---	---	---	---	---	---	---	---	**2.2 J**	**2.0 J**	**7.8 J**	**6.8 J**
2-METHYLNAPHTHALENE	91-57-6	24000	20.2	123000	---	---	---	---	---	---	---	---	13 U	**7.3 J**	**9.6 J**	**5.8 J**
ACENAPHTHENE	83-32-9	360000	6.7	43000	---	---	---	---	---	---	---	---	13 U	**5.6 J**	**15 J**	13 U
ACENAPHTHYLENE	208-96-8	360000	5.87	23000	---	---	---	---	---	---	---	---	13 U	**20 J**	**6.2 J**	13 U
ANTHRACENE	120-12-7	1800000	46.9	35000	---	---	---	---	---	---	---	---	**31 J**	**350 J**	**52 J**	**7.3 J**
BENZO(A)ANTHRACENE	56-55-3	1100	74.8	900	---	---	---	---	---	---	---	---	**570**	**700**	**790**	**82**
BENZO(A)PYRENE	50-32-8	110	88.8	400	---	---	---	---	---	---	---	---	**1000 J**	**770 J**	**1700 J**	**140 J**
BENZO(B)FLUORANTHENE	205-99-2	1100	130	900	---	---	---	---	---	---	---	---	**1900**	**1200**	**3600**	**270**
BENZO(G,H,I)PERYLENE	191-24-2	180000	67	800	---	---	---	---	---	---	---	---	**870**	**450**	**2000**	**130**
BENZO(K)FLUORANTHENE	207-08-9	11000	70	900	---	---	---	---	---	---	---	---	**600**	**380**	**1200**	**81**
CHRYSENE	218-01-9	110000	57.1	400	---	---	---	---	---	---	---	---	**1200**	**990**	**2200**	**180**
DIBENZO(A,H)ANTHRACENE	53-70-3	110	6.22	400	---	---	---	---	---	---	---	---	**180**	**140**	**380**	**26 J**
FLUORANTHENE	206-44-0	240000	111	20000	---	---	---	---	---	---	---	---	**2000**	**1800**	**3400**	**230**
FLUORENE	86-73-7	240000	21.2	28000	---	---	---	---	---	---	---	---	**10 J**	**42**	**20 J**	**4.7 J**
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	17	900	---	---	---	---	---	---	---	---	**1400**	**850**	**3200**	**190**
NAPHTHALENE	91-20-3	2000	34.6	54000	---	---	---	---	---	---	---	---	**7.9 J**	**13 J**	**22 J**	13 U
PHENANTHRENE	85-01-8	180000	86.7	40000	---	---	---	---	---	---	---	---	**490**	**680**	**900**	**100**
PYRENE	129-00-0	180000	53	13000	---	---	---	---	---	---	---	---	**1700 J**	**1500 J**	**2100 J**	**230 J**
PCBs (µg/kg)																
AROCLOR 1016	12674-11-2	410	--	--	83.1 U	76.9 U	65.6 U	---	49.2 U	---	---	---	10 U	9.2 U	54 U	12 U
AROCLOR 1221	11104-28-2	200	--	--	83.1 U	76.9 U	65.6 U	---	49.2 U	---	---	---	10 U	9.2 U	54 U	12 U
AROCLOR 1232	11141-16-5	170	--	--	83.1 U	76.9 U	65.6 U	---	49.2 U	---	---	---	12 U	11 U	63 U	15 U
AROCLOR 1242	53469-21-9	230	--	--	83.1 U	76.9 U	65.6 U	---	49.2 U	---	---	---	10 U	9.2 U	54 U	12 U
AROCLOR 1248	12672-29-6	230	--	--	83.1 U	76.9 U	65.6 U	---	49.2 U	---	---	---	10 U	9.2 U	54 U	12 U
AROCLOR 1254	11097-69-1	120	--	--	83.1 U	76.9 U	65.6 U	---	49.2 U	---	---	---	10 U	9.2 U	54 U	12 U
AROCLOR 1260	11096-82-5	240	40	--	83.1 U	76.9 U	**104**	---	**17.4 J**	---	---	---	10 U	9.2 U	54 U	12 U
TOTAL PCBS	1336-36-3	120	40	10000	83.1 U	76.9 U	**104**	---	**17.4 J**	---	---	---	10 U	9.2 U	54 U	12 U
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700	--	--	---	---	---	---	---	---	---	---	**5240**	**5580**	**6440**	**7980**
ANTIMONY	7440-36-0	3.1	2	10	---	---	---	---	---	---	---	---	**0.095**	**0.074 J**	**0.162**	**0.140**
ARSENIC	7440-38-2	0.68	7.24	7	**1.4 J**	**1.0 J**	**2.7 J**	**2.52 J**	1.7 U	**1.3 J**	**7.2**	**4.8**	**2.42**	**2.14**	**2.86**	**3.69**
BARIUM	7440-39-3	1500	48	5500	**16.3**	**15.0**	**6.3**	**6.14**	**1.5 J**	**2.9**	**24.0**	**15.6**	**15.6**	**13.4**	**22.4**	**17.3**
BERYLLIUM	7440-41-7	16	--	0.4	---	---	---	---	---	---	---	---	**0.417**	**0.376**	**0.498**	**0.519**
CADMIUM	7440-43-9	7.1	0.68	39	0.5 U	0.5 U	**0.2 J**	**0.14 J**	0.3 U	0.3 U	0.6 U	0.5 U	**0.083 J**	**0.0692 J**	**0.150**	**0.135**
CALCIUM	7440-70-2	--	--	--	---	---	---	---	---	---	---	---	**655**	**464**	**1040**	**700**
CHROMIUM	7440-47-3	12000	43.4	1400/390	**8.5**	**6.4**	**8.1**	**7.78**	**2.3**	**3.9**	**7.4**	**9.9**	**6.74**	**6.94**	**8.21**	**9.77**
COBALT	7440-48-4	2.3	10	--	---	---	---	---	---	---	---	---	**2.26**	**2.37**	**4.06**	**4.33**
COPPER	7440-50-8	310	18.7	3100	---	---	---	---	---	---	---	---	**8.34**	**6.54**	**13.4**	**11.2**
IRON	7439-89-6	5500	--	--	---	---	---	---	---	---	---	---	**8900**	**8040**	**11300**	**20100**
LEAD	7439-92-1	400	30.2	150	**113**	**34.3**	**118**	**107**	**4.6**	**6.2**	**34.3**	**34.4**	**17.9**	**20.2**	**31.5**	**30.0**
MAGNESIUM	7439-95-4	--	--	--	---	---	---	---	---	---	---	---	**1170**	**1180**	**1620**	**2200**
MANGANESE	7439-96-5	180	260	390	---	---	---	---	---	---	---	---	**76.1**	**67.8**	**170**	**118**
MERCURY	7439-97-6	1.1	0.13	23	**0.031**	**0.022 J**	0.035 U	---	0.023 U	0.021 U	**0.026 J**	**0.044**	**0.024 J**	**0.014 J**	**0.041**	**0.044**
NICKEL	7440-02-0	150	15.9	1000	---	---	---	---	---	---	---	---	**5.00**	**4.90**	**6.10**	**9.17**
POTASSIUM	7440-09-7	--	--	--	---	---	---	---	---	---	---	---	**346**	**321**	**623**	**363**
SELENIUM	7782-49-2	39	1	390	**0.8 J**	4.6 U	**1.0 J**	**0.92 J**	3.3 U	3.7 UJ	6.8 UJ	6.0 UJ	**0.160 J**	**0.150 J**	**0.393**	**0.320 J**
SILVER	7440-22-4	39	0.73	200	0.5 U	0.5 U	0.6 U	0.6 U	0.3 U	0.3 U	0.6 U	0.5 U	**0.035 J**	**0.033 J**	**0.067**	**0.052 J**
SODIUM	7440-23-5	--	--	--	---	---	---	---	---	---	---	---	94 U	78 U	65 U	84 U
THALLIUM	7440-28-0	0.078	--	5.5	---	---	---	---	---	---	---	---	**0.072 J**	**0.067 J**	**0.103**	**0.0904**
VANADIUM	7440-62-2	39	57	550	---	---	---	---	---	---	---	---	**9.54**	**8.93**	**12.6**	**14.7**
ZINC	7440-66-6	2300	121	6000	---	---	---	---	---	---	---	---	**61.1**	**45.3**	**84.5**	**112**

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Table 5-7
Summary of Sediment Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-3A		SED-4A		SED-5A	SED-103-2014	SED-104-2014	SED-105-2014	SED-326	SED-327	SED-328	SED-329
				SAMPLE ID	SED 3A 0-0.5	SED 3AD 0-0.5	SED-4A 0-0.5	SED-4A 0-0.5DUP	SED-5A 0-0.5	SED-103-A-2014	SED-104-A-2014	SED-105-A-2014	SED-326-CI19-0-0.5	SED-327-CI19-0-0.5	SED-328-CI19-0-0.5	SED-329-CI19-0-0.5
				SAMPLE DATE	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11	31-Jul-14 / 05-Aug-14	31-Jul-14 / 05-Aug-14	31-Jul-14 / 05-Aug-14	1-Oct-19	1-Oct-19	1-Oct-19	1-Oct-19
				QC IDENTIFIER	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE								
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
TOC (mg/kg)																
TOTAL ORGANIC CARBON (TOC)		--	--	--	---	---	**33600**	---	---	---	---	---	---	**18000 J**	---	**33000 J**
ACID VOLATILE SULFIDE (µmol/g)***		--	--	--												
ACID VOLATILE SULFIDE		--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
SIMULTANEOUSLY EXTRACTED METALS (µmol/g)***																
ANTIMONY	7440-36-0				---	---	---	---	---	---	---	---	---	---	---	---
CADMIUM	7440-43-9				---	---	---	---	---	---	---	---	---	---	---	---
CHROMIUM	7440-47-3				---	---	---	---	---	---	---	---	---	---	---	---
COPPER	7440-50-8				---	---	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1				---	---	---	---	---	---	---	---	---	---	---	---
MERCURY	7439-97-6				---	---	---	---	---	---	---	---	---	---	---	---
NICKEL	7440-02-0				---	---	---	---	---	---	---	---	---	---	---	---
SILVER	7440-22-4				---	---	---	---	---	---	---	---	---	---	---	---
ZINC	7440-66-6				---	---	---	---	---	---	---	---	---	---	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Region III BTAG sediment screening values (USEPA, 2006)
b) NOAA Screening Quick Reference Table values (Buchman, 2008)
See risk assessment for additional details.
***AVS/SEM analysis performed on samples collected on May 28, 2020.
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

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Table 5-7
Summary of Sediment Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-330	SED-331	SED-332	SED-333	SED-334	SED-335	SED-336		SED-337	SED-338	SED-339	SED-340
				SAMPLE ID	SED-330-CI19-0-0.5	SED-331-CI19-0-0.5	SED-332-CI19-0-0.5	SED-333-CI19-0-0.5	SED-334-CI19-0-0.5	SED-335-CI19-0-0.5	SED-336-CI19-0-0.5	ED-336-CI19-0-0.5-DU	SED-337-CI19-0-0.5	SED-338-CI19-0-0.5	SED-339-CI19-0-0.5	SED-340-CI19-0-0.5
				SAMPLE DATE	1-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19
				QC IDENTIFIER							DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
VOCs (ug/kg)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	--	2200	---	---	---	---	---	---	---	---	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	--	540000	---	---	---	---	---	---	---	---	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	--	--	---	---	---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	--	3600	---	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	--	920000	---	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	--	200	---	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	--	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	--	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	473	96000	---	---	---	---	---	---	---	---	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	--	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	--	10	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	16.5	--	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	--	900	---	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	--	1900	---	---	---	---	---	---	---	---	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	842	--	---	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	460	--	---	---	---	---	---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
2-HEXANONE	591-78-6	20000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
ACETONE	67-64-1	6100000	--	7800000	---	---	---	---	---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	--	2500	---	---	---	---	---	---	---	---	---	---	---	---
BROMOBENZENE	108-86-1	29000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BROMOMETHANE	74-83-9	--	--	800	---	---	---	---	---	---	---	---	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	--	10000	---	---	---	---	---	---	---	---	---	---	---	---
BROMOFORM	75-25-2	19000	--	81000	---	---	---	---	---	---	---	---	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	0.851	--	---	---	---	---	---	---	---	---	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	--	1500	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROBENZENE	108-90-7	28000	--	210000	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROETHANE	75-00-3	1400000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROFORM	67-66-3	320	--	1200	---	---	---	---	---	---	---	---	---	---	---	---
CHLOROMETHANE	74-87-3	11000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	--	630000	---	---	---	---	---	---	---	---	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	---	---	---	---	---	---	---	---	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	--	--	---	---	---	---	---	---	---	---	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	--	--	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	--	71000	---	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBUTADIENE	87-68-3	1200	--	--	---	---	---	---	---	---	---	---	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	86	--	---	---	---	---	---	---	---	---	---	---	---	---
METHYL BROMIDE	74-83-9	--	--	800	---	---	---	---	---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	---	---	---	---	---	---	---	---	---	---	---	---
METHYLENE CHLORIDE	75-09-2	35000	--	45000	---	---	---	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	3800	34.6	54000	---	---	---	---	---	---	---	---	---	---	---	---
N-BUTYL BENZENE	104-51-8	390000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000	137	--	---	---	---	---	---	---	---	---	---	---	---	---
STYRENE	100-42-5	600000	--	13000	---	---	---	---	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000	137	--	---	---	---	---	---	---	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	--	12000	---	---	---	---	---	---	---	---	---	---	---	---

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Table 5-7
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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-330	SED-331	SED-332	SED-333	SED-334	SED-335	SED-336		SED-337	SED-338	SED-339	SED-340
				SAMPLE ID	SED-330-CI19-0-0.5	SED-331-CI19-0-0.5	SED-332-CI19-0-0.5	SED-333-CI19-0-0.5	SED-334-CI19-0-0.5	SED-335-CI19-0-0.5	SED-336-CI19-0-0.5	ED-336-CI19-0-0.5-DU	SED-337-CI19-0-0.5	SED-338-CI19-0-0.5	SED-339-CI19-0-0.5	SED-340-CI19-0-0.5
				SAMPLE DATE	1-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19
				QC IDENTIFIER							DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
VOCs (ug/kg)																
TOLUENE	108-88-3	490000	1090	190000	---	---	---	---	---	---	---	---	---	---	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	--	1100000	---	---	---	---	---	---	---	---	---	---	---	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	--	13000	---	---	---	---	---	---	---	---	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
VINYL CHLORIDE	75-01-4	59	--	20	---	---	---	---	---	---	---	---	---	---	---	---
XYLENE O	95-47-6	65000	--	--	---	---	---	---	---	---	---	---	---	---	---	---
XYLENE P,M	179601-23-1	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---
SVOC (µg/kg)																
1,2,4-TRICHLOROBENZENE	120-82-1	5800	473	96000	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
1,2-DICHLOROBENZENE	95-50-1	180000	16.5	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
1,3-DICHLOROBENZENE	541-73-1	--	842	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
1,4-DICHLOROBENZENE	106-46-7	2600	460	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000	--	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	330000	750 U	47000 U	5200 U	1300 U	2100 U	2500 U	2400 U	2500 U	1000 U	960 U	790 U	670 U
2,4,6-TRICHLOROPHENOL	88-06-2	6300	213	58000	300 U	19000 U	2100 U	530 U	850 U	1000 U	970 U	1000 U	420 U	380 U	320 U	270 U
2,4-DICHLOROPHENOL	120-83-2	19000	117	30000	300 U	19000 U	2100 U	530 U	850 U	1000 U	970 U	1000 U	420 U	380 U	320 U	270 U
2,4-DIMETHYLPHENOL	105-67-9	130000	29	--	300 U	19000 U	2100 U	530 U	850 U	1000 U	970 U	1000 U	420 U	380 U	320 U	270 U
2,4-DINITROPHENOL	51-28-5	13000	--	160000	750 U	47000 U	5200 U	1300 U	2100 U	2500 U	2400 U	2500 U	1000 U	960 U	790 U	670 U
2,4-DINITROTOLUENE	121-14-2	1700	41.6	900	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
2,6-DINITROTOLUENE	606-20-2	360	--	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
2-CHLORONAPHTHALENE	91-58-7	480000	--	--	300 UJ	19000 UJ	2100 UJ	530 UJ	850 UJ	1000 UJ	970 UJ	1000 UJ	420 UJ	380 U	320 U	270 U
2-CHLOROPHENOL	95-57-8	39000	31.2	50000	300 U	19000 U	2100 U	530 U	850 U	1000 U	970 U	1000 U	420 U	380 U	320 U	270 U
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	--	--	300 U	19000 U	2100 U	530 U	850 U	1000 U	970 U	1000 U	420 U	380 U	320 U	270 U
2-NITROANILINE	88-74-4	63000	--	--	750 U	47000 U	5200 U	1300 UJ	2100 U	2500 UJ	2400 U	2500 U	1000 U	960 U	790 U	670 U
2-NITROPHENOL	88-75-5	--	--	--	300 U	19000 U	2100 U	530 U	850 U	1000 U	970 U	1000 U	420 U	380 U	320 U	270 U
3,3'-DICHLOROBENZIDINE	91-94-1	1200	127	1400	300 UJ	19000 UJ	2100 UJ	530 UJ	850 UJ	1000 UJ	970 UJ	1000 UJ	420 UJ	380 UJ	320 U	270 U
3-NITROANILINE	99-09-2	--	--	--	750 U	47000 U	5200 U	1300 UJ	2100 U	2500 UJ	2400 U	2500 U	1000 U	960 U	790 U	670 U
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	--	--	750 U	47000 U	5200 U	1300 U	2100 U	2500 U	2400 U	2500 U	1000 U	960 U	790 U	670 U
4-BROMOPHENYL PHENYL ETHER	101-55-3	--	1230	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
4-CHLORO-3-METHYLPHENOL	59-50-7	630000	--	--	300 U	19000 U	2100 U	530 U	850 U	1000 U	970 U	1000 U	420 U	380 U	320 U	270 U
4-CHLOROANILINE	106-47-8	2700	--	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	--	--	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
4-NITROANILINE	100-01-6	25000	--	--	750 U	47000 U	5200 U	1300 UJ	2100 U	2500 UJ	2400 U	2500 U	1000 U	960 U	790 U	670 U
4-NITROPHENOL	100-02-7	--	--	--	750 U	47000 U	5200 U	1300 U	2100 U	2500 U	2400 U	2500 U	1000 U	960 U	790 U	670 U
BENZOIC ACID	65-85-0	25000000	650	--	750 UJ	47000 UJ	5200 UJ	1300 UJ	2100 UJ	2500 UJ	2400 UJ	2500 UJ	1000 UJ	960 UJ	790 UJ	670 UJ
BENZYL ALCOHOL	100-51-6	630000	52	--	600 U	38000 U	4200 U	1000 UJ	1700 U	2000 UJ	1900 U	2000 U	830 U	770 U	640 U	540 U
BENZYL BUTYL PHTHALATE	85-68-7	290000	10900	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000	--	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	111-44-4	230	--	600	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	180	46000	300 U	19000 U	2100 U	530 UJ	850 U	**2200 J**	970 U	1000 U	**180 J**	380 U	**290 J**	**110 J**
CARBAZOLE	86-74-8	240000	21.2	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
CRESOLS, M- & P-					300 U	19000 U	2100 U	530 U	850 U	1000 U	970 U	1000 U	420 U	380 U	320 U	270 U
DIBENZOFURAN	132-64-9	7300	415	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
DIETHYL PHTHALATE	84-66-2	5100000	218	340000	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
DIMETHYL PHTHALATE	131-11-3	--	--	1900000	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
DI-N-BUTYL PHTHALATE	84-74-2	630000	1160	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
DI-N-OCTYL PHTHALATE	117-84-0	63000	61	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
HEXACHLOROBENZENE	118-74-1	210	20	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
HEXACHLOROETHANE	67-72-1	1800	804	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
ISOPHORONE	78-59-1	570000	--	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
NITROBENZENE	98-95-3	5100	--	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
N-NITROSODIMETHYLAMINE	62-75-9	2	--	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	--	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
N-NITROSODIPHENYLAMINE	86-30-6	110000	2680	--	300 U	19000 U	2100 U	530 UJ	850 U	1000 UJ	970 U	1000 U	420 U	380 U	320 U	270 U
PENTACHLOROPHENOL	87-86-5	1000	504	5300	750 U	47000 U	5200 U	1300 U	2100 U	2500 U	2400 U	2500 U	1000 U	960 U	790 U	670 U
PHENOL	108-95-2	1900000	420	6000000	300 U	19000 U	2100 U	530 U	850 U	1000 U	970 U	1000 U	420 U	380 U	320 U	270 U

Table 5-7
Summary of Sediment Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-330	SED-331	SED-332	SED-333	SED-334	SED-335	SED-336		SED-337	SED-338	SED-339	SED-340
				SAMPLE ID	SED-330-CI19-0-0.5	SED-331-CI19-0-0.5	SED-332-CI19-0-0.5	SED-333-CI19-0-0.5	SED-334-CI19-0-0.5	SED-335-CI19-0-0.5	SED-336-CI19-0-0.5	ED-336-CI19-0-0.5-DU	SED-337-CI19-0-0.5	SED-338-CI19-0-0.5	SED-339-CI19-0-0.5	SED-340-CI19-0-0.5
				SAMPLE DATE	1-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19
				QC IDENTIFIER							DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
PAHs (µg/kg)																
1-METHYLNAPHTHALENE	90-12-0	18000	21	--	12 U	**23 J**	85 U	**4.4 J**	**200**	**180**	**63 J**	**48 J**	**97**	**36**	**4.1 J**	**10 J**
2-METHYLNAPHTHALENE	91-57-6	24000	20.2	123000	12 U	**27 J**	85 U	**4.8 J**	**230**	**240**	**77 J**	**57 J**	**180**	**53**	**4.4 J**	**12 J**
ACENAPHTHENE	83-32-9	360000	6.7	43000	12 U	76 U	85 U	21 U	**27 J**	40 U	**17 J**	**18 J**	**39**	**41**	**11 J**	11 U
ACENAPHTHYLENE	208-96-8	360000	5.87	23000	12 U	76 U	85 U	21 U	**31 J**	**46 J**	39 U	**9.8 J**	**18 J**	**7.9 J**	13 U	**4.1 J**
ANTHRACENE	120-12-7	1800000	46.9	35000	**5.3 J**	**33 J**	**18 J**	**4.7 J**	**80 J**	**93 J**	**49 J**	**50 J**	**64 J**	**98 J**	**22 J**	11 UJ
BENZO(A)ANTHRACENE	56-55-3	1100	74.8	900	**77**	**370**	**230**	**47**	**540**	**790**	**290**	**270**	**480**	**340 J**	**89**	**25**
BENZO(A)PYRENE	50-32-8	110	88.8	400	**170 J**	**810 J**	**450 J**	**70 J**	**920 J**	**1300 J**	**470 J**	**380 J**	**750 J**	**420 J**	**93 J**	**48 J**
BENZO(B)FLUORANTHENE	205-99-2	1100	130	900	**390**	**1400**	**850**	**110**	**1100**	**1400**	**580**	**500**	**810**	**530**	**140**	**58**
BENZO(G,H,I)PERYLENE	191-24-2	180000	67	800	**150**	**590**	**270**	**46**	**600**	**800**	**290**	**200**	**410**	**250 J**	**46**	**27**
BENZO(K)FLUORANTHENE	207-08-9	11000	70	900	**110**	**410**	**250**	**40 J**	**350**	**390**	**200**	**170**	**230**	**170 J**	**44**	**19 J**
CHRYSENE	218-01-9	110000	57.1	400	**200**	**820**	**470**	**82**	**1000**	**1300**	**470**	**400**	**710**	**470**	**91**	**59**
DIBENZO(A,H)ANTHRACENE	53-70-3	110	6.22	400	**38**	**140 J**	**84 J**	**14 J**	**170**	**240**	**97**	**66 J**	**130**	**73**	**18 J**	**8.7 J**
FLUORANTHENE	206-44-0	240000	111	20000	**270**	**1100**	**690**	**120**	**880**	**1000**	**520**	**490**	**1100**	**740**	**180**	**48**
FLUORENE	86-73-7	240000	21.2	28000	12 U	**43 J**	85 U	21 U	**120**	**230**	**52 J**	**42 J**	**72**	**65**	**14 J**	**5.8 J**
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	17	900	**220**	**700**	**320**	**72**	**500**	**740**	**320**	**220**	**350**	**250 J**	**59**	**31**
NAPHTHALENE	91-20-3	2000	34.6	54000	12 U	76 U	85 U	21 U	**360**	**370**	**120**	**84**	**210**	**86**	**7.2 J**	**20 J**
PHENANTHRENE	85-01-8	180000	86.7	40000	**90**	**530**	**290**	**70**	**1300**	**1900**	**520**	**450**	**560**	**550**	**120**	**73**
PYRENE	129-00-0	180000	53	13000	**240 J**	**2100 J**	**700 J**	**120 J**	**1700 J**	**2100 J**	**980 J**	**780 J**	**1500 J**	**980**	**170**	**86**
PCBs (µg/kg)																
AROCLOR 1016	12674-11-2	410	--	--	10 U	68 UJ	72 U	22 U	32 U	37 U	40 UJ	37 U	16 U	14 U	12 U	10 U
AROCLOR 1221	11104-28-2	200	--	--	10 U	68 UJ	72 U	22 U	32 U	37 U	40 UJ	37 U	16 U	14 U	12 U	10 U
AROCLOR 1232	11141-16-5	170	--	--	12 U	80 UJ	84 U	26 U	38 U	43 U	47 UJ	44 U	19 U	16 U	14 U	12 U
AROCLOR 1242	53469-21-9	230	--	--	10 U	68 UJ	72 U	22 U	32 U	37 U	40 UJ	37 U	16 U	14 U	12 U	10 U
AROCLOR 1248	12672-29-6	230	--	--	10 U	68 UJ	72 U	22 U	32 U	37 U	40 UJ	37 U	16 U	14 U	12 U	10 U
AROCLOR 1254	11097-69-1	120	--	--	10 U	68 UJ	72 U	22 U	32 U	37 U	40 UJ	37 U	16 U	14 U	12 U	10 U
AROCLOR 1260	11096-82-5	240	40	--	**22**	68 UJ	72 U	22 U	**170**	**1300**	**340 J**	**130 J**	**170**	**140**	**28**	**56**
TOTAL PCBS	1336-36-3	120	40	10000	**22 J**	68 UJ	72 U	22 U	**170 J**	**1300**	**340 J**	**130 J**	**170 J**	**140 J**	**28 J**	**56 J**
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700	--	--	**5060**	**6020**	**14100**	**20500**	**19300**	**16900**	**23300**	**18000**	**5710**	**3920**	**2100**	**2300**
ANTIMONY	7440-36-0	3.1	2	10	**0.061 J**	**1.10**	**0.560 J**	**0.200**	**8.66**	**0.898**	**0.400**	**0.300 J**	**0.160**	**0.066 J**	**0.024 J**	**0.021 J**
ARSENIC	7440-38-2	0.68	7.24	7	**1.53**	**15.9**	**14.4**	**11.1**	**31.7**	**26.4**	**11.0**	**10.4**	**3.60**	**2.41**	**0.91**	**0.59**
BARIUM	7440-39-3	1500	48	5500	**12.7**	**87.5**	**120**	**32.7**	**43.6**	**34.6**	**25.7**	**22.6**	**10.7**	**7.06**	**3.78**	**3.03**
BERYLLIUM	7440-41-7	16	--	0.4	**0.515**	**0.787**	**1.65**	**1.18**	**0.951**	**1.48**	**1.42**	**1.14**	**0.554**	**0.409**	**0.231**	**0.215**
CADMIUM	7440-43-9	7.1	0.68	39	**0.0563 J**	**0.964**	**2.90**	**0.59**	**49.9**	**0.892**	**0.517**	**0.639**	**0.564**	**0.305**	**0.072**	**0.013 J**
CALCIUM	7440-70-2	--	--	--	**668**	**6670**	**5950**	**1710**	**2540**	**3470**	**3240**	**3030**	**1310**	**834 J**	**504**	**310**
CHROMIUM	7440-47-3	12000	43.4	1400/390	**5.44**	**10.4**	**22.4**	**22.8**	**70.5**	**44.4**	**36.6**	**34.5**	**15.0**	**10.2 J**	**4.49**	**3.24**
COBALT	7440-48-4	2.3	10	--	**2.48**	**21.8**	**31.0**	**8.14**	**9.31**	**10.0**	**5.79**	**5.20**	**3.01**	**2.00**	**1.01**	**1.06**
COPPER	7440-50-8	310	18.7	3100	**6.12**	**36.7**	**50.6**	**21.5**	**32.3**	**75.3**	**51.1**	**39.5**	**20.2**	**14.2 J**	**4.35**	**3.54**
IRON	7439-89-6	5500	--	--	**9210**	**123000**	**92500**	**24800**	**41100**	**30600**	**17900**	**16600**	**12200**	**7540**	**4120**	**4030**
LEAD	7439-92-1	400	30.2	150	**11.9**	**42.0**	**82.4**	**116**	**221**	**584**	**314 J**	**181 J**	**111**	**43.3 J**	**7.57**	**9.27**
MAGNESIUM	7439-95-4	--	--	--	**1330**	**974**	**3120**	**3910**	**5910**	**6960**	**7700**	**7180**	**2290**	**1820 J**	**1080**	**894**
MANGANESE	7439-96-5	180	260	390	**90**	**1500**	**2410**	**338**	**778**	**220**	**169**	**160**	**153**	**87.6 J**	**49.8**	**43.2**
MERCURY	7439-97-6	1.1	0.13	23	**0.015 J**	**0.210 J**	**0.150 J**	**0.0919**	**0.150**	**0.289**	**0.229**	**0.140**	**0.066**	**0.039**	**0.011 J**	**0.012 J**
NICKEL	7440-02-0	150	15.9	1000	**4.73**	**16.1**	**25.0**	**15.1**	**118**	**33.2**	**18.4**	**17.0**	**9.30**	**5.78**	**2.62**	**2.85**
POTASSIUM	7440-09-7	--	--	--	**450**	**458 J**	**1210**	**1130**	**1630**	**2900**	**2870**	**2810**	**1150**	**898**	**531**	**423**
SELENIUM	7782-49-2	39	1	390	**0.140 J**	**1.50 J**	**6.19**	**0.792 J**	**19.9**	**1.31 J**	**1.23 J**	**0.970 J**	**0.340 J**	**0.170 J**	**0.050 J**	0.20 U
SILVER	7440-22-4	39	0.73	200	**0.034 J**	**0.23 J**	**0.28 J**	**0.169 J**	**10.1**	**0.837**	**0.564**	**0.397**	**0.208**	**0.129**	**0.034 J**	**0.009 J**
SODIUM	7440-23-5	--	--	--	69 U	**345 J**	**798**	**1610**	**5620**	**16800**	**25800**	**26300**	**4740**	**4860**	**3190**	**1410**
THALLIUM	7440-28-0	0.078	--	5.5	**0.0756**	**0.240 J**	**0.450 J**	**0.263**	**0.220**	**0.260 J**	**0.295**	**0.220 J**	**0.130**	**0.085 J**	**0.051 J**	**0.032 J**
VANADIUM	7440-62-2	39	57	550	**8.07**	**23.3**	**24.6**	**31.6**	**154**	**70.5**	**63.1**	**49.8**	**16.5**	**9.71**	**4.47**	**4.45**
ZINC	7440-66-6	2300	121	6000	**48.7**	**294**	**330**	**118**	**212**	**253**	**114**	**118**	**92.4**	**62.4 J**	**23.1**	**19.0**

Table 5-7
Summary of Sediment Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-330	SED-331	SED-332	SED-333	SED-334	SED-335	SED-336		SED-337	SED-338	SED-339	SED-340
				SAMPLE ID	SED-330-CI19-0-0.5	SED-331-CI19-0-0.5	SED-332-CI19-0-0.5	SED-333-CI19-0-0.5	SED-334-CI19-0-0.5	SED-335-CI19-0-0.5	SED-336-CI19-0-0.5	ED-336-CI19-0-0.5-DU	SED-337-CI19-0-0.5	SED-338-CI19-0-0.5	SED-339-CI19-0-0.5	SED-340-CI19-0-0.5
				SAMPLE DATE	1-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19	2-Oct-19
				QC IDENTIFIER							DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**												
TOC (mg/kg)																
TOTAL ORGANIC CARBON (TOC)		--	--	--	---	**440000 J**	---	**68000 J**	---	**190000 J**	---	---	**39000 J**	---	**10000 J**	---
ACID VOLATILE SULFIDE (µmol/g)* **		--	--	--												
ACID VOLATILE SULFIDE		--	--	--	---	0.097 U	---	**1.8**	---	**3.2**	---	---	**1.8**	---	**0.072 J**	---
SIMULTANEOUSLY EXTRACTED METALS (µmol/g)* **																
ANTIMONY	7440-36-0				---	0.0011 U	---	0.0047 U	---	0.0033 U	---	---	0.0011 U	---	0.00082 U	---
CADMIUM	7440-43-9				---	**0.000124 J**	---	**0.00189 J**	---	**0.000938 J**	---	---	**0.000235 J**	---	**0.000051 J**	---
CHROMIUM	7440-47-3				---	**0.00382 J**	---	**0.200**	---	**0.0601**	---	---	**0.00535 J**	---	**0.0143**	---
COPPER	7440-50-8				---	**0.00856 J**	---	**0.288**	---	**0.0689**	---	---	**0.00701 J**	---	**0.0262**	---
LEAD	7439-92-1				---	**0.0151**	---	**0.678**	---	**0.260**	---	---	**0.0100**	---	**0.0156**	---
MERCURY	7439-97-6				---	**0.00372 J**	---	**0.136**	---	**0.0414**	---	---	**0.00296 J**	---	**0.0106**	---
NICKEL	7440-02-0				---	0.0010 U	---	**0.00323 J**	---	**0.00066 J**	---	---	0.0011 U	---	0.00078 U	---
SILVER	7440-22-4				---	**0.0659**	---	**1.18**	---	**0.404**	---	---	**0.0731**	---	**0.120**	---
ZINC	7440-66-6				---	**0.000010 JB**	---	**0.0000241 JB**	---	**0.000041** UB	---	---	**0.000014** UB	---	**0.0000046 JB**	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Region III BTAG sediment screening values (USEPA, 2006)
b) NOAA Screening Quick Reference Table values (Buchman, 2008)
See risk assessment for additional details.
***AVS/SEM analysis performed on samples collected on May 28, 2020.
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value

Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

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Table 5-8
Summary of Sediment Analytical Data - Off-Project Upstream/Background Tidal Stream
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-1A	SED-1A	SED-101-2014	SED-321	SED-322		SED-323	SED-324	SED-325
				SAMPLE ID	SED 1A 0-0.5	SED 1A 0-0.5DUP	SED-101-A-2014	SED-321-CI19-0-0.5	SED-322-CI19-0-0.5	SED-322-CI19-0-0.5-DUP	SED-323-CI19-0-0.5	SED-324-CI19-0-0.5	SED-325-CI19-0-0.5
				SAMPLE DATE	11/30/2011	11/30/2011	8/1/2014	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019
				QC IDENTIFIER	DUPLICATE	DUPLICATE			DUPLICATE	DUPLICATE			
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**									
VOCs (µg/kg)													
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	--	2200	4.6 U	---	3.8 U	---	---	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	--	540000	4.6 U	---	3.8 U	---	---	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	--	--	4.6 U	---	1.9 U	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	--	3600	4.6 U	---	3.8 U	---	---	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	--	920000	4.6 U	---	3.8 U	---	---	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	--	200	4.6 U	---	3.8 U	---	---	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6	--	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	473	96000	4.6 U	---	3.8 U	---	---	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	--	10	4.6 U	---	3.8 U	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	16.5	--	4.6 U	---	3.8 U	---	---	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	--	900	4.6 U	---	3.8 U	---	---	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	--	1900	4.6 U	---	3.8 U	---	---	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	842	--	4.6 U	---	3.8 U	---	---	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	460	--	4.6 U	---	3.8 U	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7	--	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	--	--	45.7 U	---	**4.1 J**	---	---	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
2-HEXANONE	591-78-6	20000	--	--	45.7 U	---	9.5 U	---	---	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	--	--	45.7 U	---	9.5 U	---	---	---	---	---	---
BENZENE	71-43-2	1200	--	2500	4.6 U	---	3.8 U	---	---	---	---	---	---
BROMOBENZENE	108-86-1	29000	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	--	10000	4.6 U	---	3.8 U	---	---	---	---	---	---
BROMOFORM	75-25-2	19000	--	81000	4.6 U	---	3.8 U	---	---	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	0.851	--	4.6 U	---	3.8 U	---	---	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	--	1500	4.6 U	---	3.8 U	---	---	---	---	---	---
CHLOROBENZENE	108-90-7	28000	--	210000	4.6 U	---	3.8 U	---	---	---	---	---	---
CHLOROETHANE	75-00-3	1400000	--	--	9.1 U	---	3.8 U	---	---	---	---	---	---
CHLOROFORM	67-66-3	320	--	1200	4.6 U	---	3.8 U	---	---	---	---	---	---
CHLOROMETHANE	74-87-3	11000	--	--	9.1 U	---	3.8 U	---	---	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	--	630000	4.6 U	---	3.8 U	---	---	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	4.6 U	---	1.9 U	---	---	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	--	--	9.1 U	---	3.8 U	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	--	71000	4.6 U	---	3.8 U	---	---	---	---	---	---
HEXACHLOROBUTADIENE	87-68-3	1200	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	86	--	4.6 U	---	3.8 U	---	---	---	---	---	---
METHYL BROMIDE	74-83-9	--	--	800	9.1 U	---	3.8 U	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	4.6 U	---	3.8 U	---	---	---	---	---	---
METHYLENE CHLORIDE	75-09-2	35000	--	45000	22.8 U	---	3.8 U	---	---	---	---	---	---
NAPHTHALENE	91-20-3	3800	34.6	54000	0.0046 U	---	3.8 U	---	---	---	---	---	---
N-BUTYL BENZENE	104-51-8	390000	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000	137	--	4.6 U	---	3.8 U	---	---	---	---	---	---
STYRENE	100-42-5	600000	--	13000	4.6 U	---	3.8 U	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000	137	--	4.6 U	---	3.8 U	---	---	---	---	---	---
TETRACHLOROETHENE	127-18-4	8100	--	12000	4.6 U	---	3.8 U	---	---	---	---	---	---
TOLUENE	108-88-3	490000	1090	190000	4.6 U	---	3.8 U	---	---	---	---	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	--	1100000	4.6 U	---	3.8 U	---	---	---	---	---	---

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Table 5-8
Summary of Sediment Analytical Data - Off-Project Upstream/Background Tidal Stream
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-1A	SED-1A	SED-101-2014	SED-321	SED-322		SED-323	SED-324	SED-325
				SAMPLE ID	SED 1A 0-0.5	SED 1A 0-0.5DUP	SED-101-A-2014	SED-321-CI19-0-0.5	SED-322-CI19-0-0.5	SED-322-CI19-0-0.5-DUP	SED-323-CI19-0-0.5	SED-324-CI19-0-0.5	SED-325-CI19-0-0.5
				SAMPLE DATE	11/30/2011	11/30/2011	8/1/2014	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019
				QC IDENTIFIER	DUPLICATE	DUPLICATE			DUPLICATE	DUPLICATE			
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**									
VOCs (µg/kg)		--	--	--									
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	--	13000	4.6 U	---	3.8 U	---	---	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
VINYL CHLORIDE	75-01-4	59	--	20	9.1 U	---	3.8 U	---	---	---	---	---	---
XYLENE O	95-47-6	65000	--	--	4.6 U	---	3.8 U	---	---	---	---	---	---
XYLENE P,M	179601-23-1	--	--	--	9.1 U	---	7.6 U	---	---	---	---	---	---
TOTAL XYLENES	1330-20-7	--	--	110000	4.6 U	---	3.8 U	---	---	---	---	---	---
SVOC (µg/kg)													
1,2,4-TRICHLOROBENZENE	120-82-1	5800	473	96000	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
1,2-DICHLOROBENZENE	95-50-1	180000	16.5	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
1,3-DICHLOROBENZENE	541-73-1	--	842	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
1,4-DICHLOROBENZENE	106-46-7	2600	460	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	310000	--	--	---	---	---	270 U	270 U	320 U	330 U	320 UJ	280 U
2,4,5-TRICHLOROPHENOL	95-95-4	630000	819	330000	---	---	239 U	680 U	660 U	790 U	820 U	790 U	710 U
2,4,6-TRICHLOROPHENOL	88-06-2	6300	213	58000	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
2,4-DICHLOROPHENOL	120-83-2	19000	117	30000	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
2,4-DIMETHYLPHENOL	105-67-9	130000	29	--	---	---	239 U	270 U	270 U	320 U	330 U	320 UJ	280 U
2,4-DINITROPHENOL	51-28-5	13000	--	160000	---	---	1190 U	680 U	660 U	790 U	820 U	790 U	710 U
2,4-DINITROTOLUENE	121-14-2	1700	41.6	900	---	---	239 U	270 U	270 U	320 U	330 U	320 UJ	280 U
2,6-DINITROTOLUENE	606-20-2	360	--	--	---	---	239 U	270 U	270 U	320 U	330 U	320 UJ	280 U
2-CHLORONAPHTHALENE	91-58-7	480000	--	--	---	---	239 U	270 UJ	270 UJ	320 UJ	330 UJ	320 UJ	280 UJ
2-CHLOROPHENOL	95-57-8	39000	31.2	50000	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
2-METHYLPHENOL (O-CRESOL)	95-48-7	320000	--	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
2-NITROANILINE	88-74-4	63000	--	--	---	---	239 U	680 U	660 U	790 U	820 U	790 U	710 U
2-NITROPHENOL	88-75-5	--	--	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
3,3'-DICHLOROBENZIDINE	91-94-1	1200	127	1400	---	---	239 U	270 UJ	270 UJ	320 UJ	330 UJ	---	280 UJ
3-NITROANILINE	99-09-2	--	--	--	---	---	239 U	680 U	660 U	790 U	820 U	790 U	710 U
4,6-DINITRO-2-METHYLPHENOL	534-52-1	510	--	--	---	---		680 U	660 U	790 U	820 U	790 U	710 U
4-BROMOPHENYL PHENYL ETHER	101-55-3	--	1230	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
4-CHLORO-3-METHYLPHENOL	59-50-7	630000	--	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
4-CHLOROANILINE	106-47-8	2700	--	--	---	---	239 U	270 U	270 U	320 U	330 U	320 UJ	280 U
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	--	--	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
4-NITROANILINE	100-01-6	25000	--	--	---	---	239 U	680 U	660 U	790 U	820 U	790 UJ	710 U
4-NITROPHENOL	100-02-7	--	--	--	---	---	1190 U	680 U	660 U	790 U	820 U	790 U	710 U
BENZOIC ACID	65-85-0	25000000	650	--	---	---	2390 U	680 UJ	660 UJ	790 UJ	820 UJ	790 UJ	710 UJ
BENZYL ALCOHOL	100-51-6	630000	52	--	---	---	239 U	540 U	530 U	640 U	660 U	630 U	570 U
BENZYL BUTYL PHTHALATE	85-68-7	290000	10900	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
BIS(2-CHLOROETHOXY) METHANE	111-91-1	19000	--	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
BIS(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	111-44-4	230	--	600	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	39000	180	46000	---	---	**324 J**	270 U	**160 J**	**280 J**	**160 J**	---	280 U
CARBAZOLE	86-74-8	--	21.2	--	---	---	**602**	**360**	**520**	**570**	**620**	**240 J**	280 U
CRESOLS, M- & P-		--	--	--	---	---	---	270 U	270 U	320 U	330 U	320 U	280 U
DIBENZOFURAN	132-64-9	7300	415	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
DIETHYL PHTHALATE	84-66-2	5100000	218	340000	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
DIMETHYL PHTHALATE	131-11-3	--	--	1900000	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
DI-N-BUTYL PHTHALATE	84-74-2	630000	1160	--	---	---	239 U	270 U	270 U	320 U	330 U	320 UJ	280 U
DI-N-OCTYL PHTHALATE	117-84-0	63000	61	--	---	---	239 U	270 U	270 U	320 U	330 U	---	280 U
HEXACHLOROBENZENE	118-74-1	210	20	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
HEXACHLOROETHANE	67-72-1	1800	804	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
ISOPHORONE	78-59-1	570000	--	--	---	---	239 U	270 U	270 U	320 U	330 U	---	280 U
NITROBENZENE	98-95-3	5100	--	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
N-NITROSODIMETHYLAMINE	62-75-9	2	--	--	---	---	239 UJ	270 U	270 U	320 U	330 U	320 U	280 U
N-NITROSODI-N-PROPYLAMINE	621-64-7	78	--	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
N-NITROSODIPHENYLAMINE	86-30-6	110000	2680	--	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U
PENTACHLOROPHENOL	87-86-5	1000	504	5300	---	---	1190 U	680 U	660 U	790 U	820 U	790 U	710 U
PHENOL	108-95-2	1900000	420	6000000	---	---	239 U	270 U	270 U	320 U	330 U	320 U	280 U

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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-1A	SED-1A	SED-101-2014	SED-321	SED-322		SED-323	SED-324	SED-325
				SAMPLE ID	SED 1A 0-0.5	SED 1A 0-0.5DUP	SED-101-A-2014	SED-321-CI19-0-0.5	SED-322-CI19-0-0.5	SED-322-CI19-0-0.5-DUP	SED-323-CI19-0-0.5	SED-324-CI19-0-0.5	SED-325-CI19-0-0.5
				SAMPLE DATE	11/30/2011	11/30/2011	8/1/2014	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019
				QC IDENTIFIER	DUPLICATE	DUPLICATE			DUPLICATE	DUPLICATE			
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**									
PAHs (µg/kg)													
1-METHYLNAPHTHALENE	90-12-0	18000	21	--	---	---	---	55 U	54 U	64 U	67 U	**3.6 J**	12 U
2-METHYLNAPHTHALENE	91-57-6	24000	20.2	123000	---	---	239 U	55 U	54 U	64 U	67 U	**4.0 J**	12 U
ACENAPHTHENE	83-32-9	360000	6.7	43000	---	---	239 U	**31 J**	**36 J**	**34 J**	**32 J**	**18 J**	12 U
ACENAPHTHYLENE	208-96-8	360000	5.87	23000	---	---	239 U	55 U	54 U	64 U	67 U	**3.7 J**	12 U
ANTHRACENE	120-12-7	1800000	46.9	35000	---	---	**256 J**	**120 J**	**180 J**	**180 J**	**160 J**	**55 J**	**8.8 J**
BENZO(A)ANTHRACENE	56-55-3	1100	74.8	900	---	---	**2640**	**1300**	**2200**	**2300**	**2300**	**1100 J**	**120**
BENZO(A)PYRENE	50-32-8	110	88.8	400	---	---	**3390**	**1900 J**	**3900 J**	**3900 J**	**4300 J**	**1900 J**	**200 J**
BENZO(B)FLUORANTHENE	205-99-2	1100	130	900	---	---	**5860**	**3800**	**6500**	**6600**	**7200**	**4900 J**	**380**
BENZO(G,H,I)PERYLENE	191-24-2	180000	67	800	---	---	**1900**	**1300**	**2400**	**2600**	**3000**	**2100 J**	**170**
BENZO(K)FLUORANTHENE	207-08-9	11000	70	900	---	---	**1980**	**1300**	**2400**	**2600**	**2600**	**1300 J**	**130**
CHRYSENE	218-01-9	110000	57.1	400	---	---	**4320**	**2400**	**4100**	**4400**	**4700**	**2500 J**	**240**
DIBENZO(A,H)ANTHRACENE	53-70-3	110	6.22	400	---	---	**468**	**290**	**510**	**560**	**660**	**220 J**	**42**
FLUORANTHENE	206-44-0	240000	111	20000	---	---	**8470**	**4400**	**7200**	**7000**	**7700**	**3800 J**	**370**
FLUORENE	86-73-7	240000	21.2	28000	---	---	239 U	**54 J**	**64 J**	**64 J**	**57 J**	**32 J**	**4.1 J**
INDENO(1,2,3-CD)PYRENE	193-39-5	1100	17	900	---	---	**1680**	**1600**	**2600**	**3100**	**4400**	**2700 J**	**240**
NAPHTHALENE	91-20-3	2000	34.6	54000	---	---	239 U	**16 J**	**17 J**	64 U	67 U	13 U	12 U
PHENANTHRENE	85-01-8	180000	86.7	40000	---	---	**2350**	**1700**	**2300**	**2500**	**2300**	**1000 J**	**150**
PYRENE	129-00-0	180000	53	13000	---	---	**5790**	**4400 J**	**6700 J**	**6300 J**	**8200 J**	**3600 J**	**380 J**
PCBs (µg/kg)													
AROCLOR 1016	12674-11-2	410	--	--	70.1 U	---	41.5 U	4.8 U	4.6 U	5.4 U	27 U	5.3 U	8.8 U
AROCLOR 1221	11104-28-2	200	--	--	70.1 U	---	41.5 U	4.8 U	4.6 U	5.4 U	27 U	5.3 U	8.8 U
AROCLOR 1232	11141-16-5	170	--	--	70.1 U	---	41.5 U	5.7 U	5.4 U	6.3 U	32 U	6.3 U	10 U
AROCLOR 1242	53469-21-9	230	--	--	70.1 U	---	41.5 U	4.8 U	4.6 U	5.4 U	27 U	5.3 U	8.8 U
AROCLOR 1248	12672-29-6	230	--	--	70.1 U	---	**61.0 J**	4.8 U	4.6 U	5.4 U	27 U	5.3 U	8.8 U
AROCLOR 1254	11097-69-1	120	--	--	70.1 U	---	41.5 U	4.8 U	4.6 U	5.4 U	27 U	5.3 U	8.8 U
AROCLOR 1260	11096-82-5	240	40	--	70.1 U	---	**57.9 J**	4.8 U	4.6 UJ	**28 J**	27 U	5.3 U	8.8 U
AROCLOR 1262		--	--	--	70.1 U	---	41.5 U	---	---	---	---	---	---
AROCLOR 1268		--	--	--	70.1 U	---	41.5 U	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	120	40	10000	70.1 U	---	**118.9** J	4.8 U	4.6 U	**28 J**	27 U	5.3 U	8.8 U
METALS (mg/kg)													
ALUMINUM	7429-90-5	7700	--	--	---	---	---	**6000**	**6280**	**7470**	**7890**	**7420**	**5050**
ANTIMONY	7440-36-0	3.1	2	10	---	---	---	**0.14**	**0.13**	**0.131**	**0.15**	**0.14 J**	**0.05 J**
ARSENIC	7440-38-2	0.68	7.24	7	**0.3 J**	---	**4.70**	**2.50**	**2.38**	**3.01**	**2.64**	**2.78**	**1.19**
BARIUM	7440-39-3	1500	48	5500	**10.4**	---	**5.90**	**22.2**	**15.9**	**17.8**	**19.1**	**21.5**	**14.1**
BERYLLIUM	7440-41-7	16	--	0.4	---	---	---	**0.435**	**0.540**	**0.579**	**0.594**	**0.594**	**0.358**
CADMIUM	7440-43-9	7.1	0.68	39	0.4 U	---	0.2 U	**0.049 J**	**0.064 J**	**0.0604 J**	**0.053 J**	**0.104 J**	**0.025 J**
CALCIUM	7440-70-2	--	--	--	---	---	NT	**931**	**726**	**1030**	**1070**	**1160 J**	**499**
CHROMIUM	7440-47-3	12000	43.4	1400/390	**5.1**	---	**5.4**	**9.3**	**9.45**	**11.1**	**10.8**	**9.76**	**6.14**
COBALT	7440-48-4	2.3	10	--	---	---	---	**2.48**	**2.51**	**2.75**	**3.15**	**2.96**	**2.08**
COPPER	7440-50-8	310	18.7	3100	---	---	---	**11.4**	**11.6**	**12.5**	**13.4**	**11.8**	**6.27**
IRON	7439-89-6	5500	--	--	---	---	---	**8370**	**8430**	**9130**	**9020**	**9420**	**9610**
LEAD	7439-92-1	400	30.2	150	**11.3**	---	**54.2**	**28.2**	**28.4**	**35.3**	**27.9**	**28.4 J**	**12.8**
MAGNESIUM	7439-95-4	--	--	--	---	---	---	**1960**	**1400**	**1660**	**1800**	**1530 J**	**1460**
MANGANESE	7439-96-5	180	260	390	---	---	---	**127**	**97.4**	**98.2**	**106**	**122 J**	**75.2**
MERCURY	7439-97-6	1.1	0.13	23	**0.039**	**0.0211 J**	**0.028 J**	**0.053**	**0.037 J**	**0.043**	**0.041 J**	**0.038 J**	**0.01 J**
NICKEL	7440-02-0	150	15.9	1000	---	---	---	**6.00**	**6.04**	**6.90**	**7.30**	**7.06**	**4.16**
POTASSIUM	7440-09-7	--	--	--	---	---	---	**1030**	**648**	**656**	**564**	**480**	**548**
SELENIUM	7782-49-2	39	1	390	**0.60 J**	---	2.7 UJ	**0.17 J**	**0.16 J**	**0.21 J**	**0.22 J**	**0.28 J**	**0.09 J**
SILVER	7440-22-4	39	0.73	200	0.40 U	---	0.2 U	**0.044 J**	**0.051 J**	**0.0558 J**	**0.057 J**	**0.049 J**	**0.021 J**
SODIUM	7440-23-5	--	--	--	---	---	---	**144**	**109**	**129**	**104**	130 U	74 U
THALLIUM	7440-28-0	0.078	--	5.5	---	---	---	**0.092 J**	**0.0934 J**	**0.108**	**0.120**	**0.110 J**	**0.0751**
VANADIUM	7440-62-2	39	57	550	---	---	---	**12.9**	**11.2**	**12.6**	**14.2**	**13.5**	**8.9**
ZINC	7440-66-6	2300	121	6000	---	---	---	**46.8**	**50.1**	**44.4**	**44.2**	**60.1 J**	**39.5**

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Table 5-8
Summary of Sediment Analytical Data - Off-Project Upstream/Background Tidal Stream
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-1A	SED-1A	SED-101-2014	SED-321	SED-322		SED-323	SED-324	SED-325
				SAMPLE ID	SED 1A 0-0.5	SED 1A 0-0.5DUP	SED-101-A-2014	SED-321-CI19-0-0.5	SED-322-CI19-0-0.5	SED-322-CI19-0-0.5-DUP	SED-323-CI19-0-0.5	SED-324-CI19-0-0.5	SED-325-CI19-0-0.5
				SAMPLE DATE	11/30/2011	11/30/2011	8/1/2014	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019
				QC IDENTIFIER	DUPLICATE	DUPLICATE			DUPLICATE	DUPLICATE			
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**									
TOC (mg/kg)													
TOTAL ORGANIC CARBON (TOC)	--	--	--	--	---	---	---	**24000 J**	**50000**	---	**41000 J**	**41000**	**9400 J**
ACID VOLATILE SULFIDE (µmol/g)* **	--	--	--	--									
ACID VOLATILE SULFIDE	--	--	--	--	---	---	---	**0.061 J**	0.13 U	---	0.13 U	0.12 U	0.095 U
SIMULTANEOUSLY EXTRACTED METALS (µmol/g)* **													
ANTIMONY	7440-36-0				---	---	---	0.0011 U	0.0011 U	---	0.0013 U	0.0013 U	0.0011 U
CADMIUM	7440-43-9				---	---	---	**0.000529 J**	**0.000319 J**	---	**0.000775 J**	**0.00039 J**	**0.000097 J**
CHROMIUM	7440-47-3				---	---	---	**0.057**	**0.0376**	---	**0.0549**	**0.044**	**0.00289 J**
COPPER	7440-50-8				---	---	---	**0.147**	**0.105**	---	**0.111**	**0.0431**	**0.0126**
LEAD	7439-92-1				---	---	---	**0.141**	**0.106**	---	**0.0905**	**0.0241**	**0.0196**
MERCURY	7439-97-6				---	---	---	**0.0000462 B**	**0.0000178 JB**	---	**0.0000333 B**	**0.0000099 JB**	**0.0000103 JB**
NICKEL	7440-02-0				---	---	---	**0.0468**	**0.0311**	---	**0.0482**	**0.0306**	**0.00244 J**
SILVER	7440-22-4				---	---	---	**0.00089 J**	**0.00052 J**	---	**0.00077 J**	**0.00126 J**	0.00093 U
ZINC	7440-66-6				---	---	---	**0.418**	**0.215**	---	**0.66**	**0.50**	**0.05**

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Region III BTAG sediment screening values (USEPA, 2006)
b) NOAA Screening Quick Reference Table values (Buchman, 2008)
See risk assessment for additional details.
***AVS/SEM analysis performed on samples collected on May 28, 2020.
--- = Sample not analyzed for this parameter
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Bold = Detected
Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

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Table 5-9
Summary of Sediment Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	Beach-1-A	Beach-2-A	Beach-3-A	Beach-4-A	Beach-5-A		Beach-6-A	Beach-7-A	Beach-8-A	SED-ON-9	SED-ON-10
				SAMPLE ID	Beach-1-A	Beach-2-A	Beach-3-A	Beach-4-A	Beach-5-A	Beach-59-A	Beach-6-A	Beach-7-A	Beach-8-A	SED-ON-9-082515	SED-ON-10-082515
				SAMPLE DATE	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	25-Aug-15	25-Aug-15
				QC IDENTIFIER					DUPLICATE	DUPLICATE					
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**											
VOCs (µg/kg)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	--	2200	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
1,1,1-TRICHLOROETHANE	71-55-6	810000	--	540000	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	--	--	1.2 U	1.0 U	1.3 U	1.4 U	1.3 U	0.9 U	1.3 U	1.3 U	1.3 U	0.25 U	0.29 U
1,1,2-TRICHLOROETHANE	79-00-5	150	--	3600	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
1,1-DICHLOROETHANE	75-34-3	3600	--	920000	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
1,1-DICHLOROETHENE	75-35-4	23000	--	200	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
1,1-DICHLOROPROPENE	563-58-6	--	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
1,2,3-TRICHLOROBENZENE	87-61-6	6300	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
1,2,4-TRICHLOROBENZENE	120-82-1	5800	473	96000	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	1.0 U	1.2 U
1,2-DIBROMOETHANE	106-93-4	36	--	10	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
1,2-DICHLOROBENZENE	95-50-1	180000	16.5	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
1,2-DICHLOROETHANE	107-06-2	460	--	900	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
1,2-DICHLOROPROPANE	78-87-5	1600	--	1900	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
1,3-DICHLOROBENZENE	541-73-1	--	842	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
1,4-DICHLOROBENZENE	106-46-7	2600	460	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
2,2-DICHLOROPROPANE	594-20-7	--	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
2-BUTANONE (MEK)	78-93-3	2700000	--	--	6.2 U	4.9 U	6.7 U	6.8 U	6.3 U	4.3 U	6.5 U	6.3 U	6.7 U	2.5 U	2.9 U
2-CHLOROTOLUENE	95-49-8	160000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
2-HEXANONE	591-78-6	20000	--	--	6.2 U	4.9 U	6.7 U	6.8 U	6.3 U	4.3 U	6.5 U	6.3 U	6.7 U	1.0 U	1.2 U
4-CHLOROTOLUENE	106-43-4	160000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
4-ISOPROPYLTOLUENE	99-87-6	190000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
4-METHYL-2-PENTANONE	108-10-1	3300000	--	--	6.2 U	4.9 U	6.7 U	6.8 U	6.3 U	4.3 U	6.5 U	6.3 U	6.7 U	1.0 U	1.2 U
ACETONE	67-64-1	6100000	--	7800000	6.2 U	4.9 U	4.6 U	6.8 U	6.3 U	4.3 U	6.5 U	6.3 U	6.7 U	2.5 U	2.9 U
BENZENE	71-43-2	1200	--	2500	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
BROMOBENZENE	108-86-1	29000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
BROMOMETHANE	74-83-9	--	--	800	2.5 U	1.9 U	2.7 U	**1.2** J	2.5 U	1.7 U	**1.5** J	2.5 U	2.7 U	0.50 U	0.58 U
BROMOCHLOROMETHANE	74-97-5	15000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
BROMODICHLOROMETHANE	75-27-4	290	--	10000	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
BROMOFORM	75-25-2	19000	--	81000	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
CARBON DISULFIDE	75-15-0	77000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	**0.83** J	0.58 U
CARBON TETRACHLORIDE	56-23-5	650	--	1500	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
CHLOROBENZENE	108-90-7	28000	--	210000	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
CHLOROETHANE	75-00-3	1400000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
CHLOROFORM	67-66-3	320	--	1200	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
CHLOROMETHANE	74-87-3	11000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	1.0 U	1.2 U
CIS-1,2-DICHLOROETHENE	156-59-2	16000	--	630000	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	1.2 U	1.0 U	1.3 U	1.4 U	1.3 U	0.9 U	1.3 U	1.3 U	1.3 U	0.50 U	0.58 U
DIBROMOMETHANE	74-95-3	2400	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
DICHLORODIFLUOROMETHANE	75-71-8	8700	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
ETHYLBENZENE	100-41-4	5800	--	71000	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
HEXACHLOROBUTADIENE	87-68-3	1200	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
ISOPROPYLBENZENE	98-82-8	190000	86	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
METHYL BROMIDE	74-83-9	--	--	800	2.5 U	1.9 U	2.7 U	**1.2** J	2.5 U	1.7 U	**1.5** J	2.5 U	2.7 U	0.50 U	0.58 U
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
METHYLENE CHLORIDE	75-09-2	35000	--	45000	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
NAPHTHALENE	91-20-3	3800	34.6	54000	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
N-BUTYL BENZENE	104-51-8	390000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
N-PROPYL BENZENE	103-65-1	380000	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	--	--	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
SEC-BUTYL BENZENE	135-98-8	780000	137	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
STYRENE	100-42-5	600000	--	13000	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
TERT-BUTYLBENZENE	98-06-6	780000	137	--	2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U

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Table 5-9
Summary of Sediment Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

					SAMPLE LOCATION	Beach-1-A	Beach-2-A	Beach-3-A	Beach-4-A	Beach-5-A		Beach-6-A	Beach-7-A	Beach-8-A	SED-ON-9	SED-ON-10
					SAMPLE ID	Beach-1-A	Beach-2-A	Beach-3-A	Beach-4-A	Beach-5-A	Beach-59-A	Beach-6-A	Beach-7-A	Beach-8-A	SED-ON-9-082515	SED-ON-10-082515
					SAMPLE DATE	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	25-Aug-15	25-Aug-15
					QC IDENTIFIER					DUPLICATE	DUPLICATE					
VOCs (µg/kg)																
TETRACHLOROETHENE	127-18-4	8100	--	--		2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
TOLUENE	108-88-3	490000	1090	190000		2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	--	1100000		2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	--	--		2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
TRICHLOROETHYLENE	79-01-6	410	--	13000		2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
TRICHLOROFLUOROMETHANE	75-69-4	2300000	--	--		2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
VINYL CHLORIDE	75-01-4	59	--	20		2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.50 U	0.58 U
XYLENE O	95-47-6	65000	--	--		2.5 U	1.9 U	2.7 U	2.7 U	2.5 U	1.7 U	2.6 U	2.5 U	2.7 U	0.25 U	0.29 U
XYLENE P,M	179601-23-1	--	--	--		4.9 U	3.9 U	5.4 U	5.4 U	5.0 U	3.4 U	5.2 U	5.0 U	5.4 U	0.50 U	0.58 U
PCBs (µg/kg)																
Aroclor 1016	12674-11-2	410	--	--		---	---	---	---	---	---	---	---	---	---	---
Aroclor 1221	11104-28-2	200	--	--		---	---	---	---	---	---	---	---	---	---	---
Aroclor 1232	11141-16-5	170	--	--		---	---	---	---	---	---	---	---	---	---	---
Aroclor 1242	53469-21-9	230	--	--		---	---	---	---	---	---	---	---	---	---	---
Aroclor 1248	12672-29-6	230	--	--		---	---	---	---	---	---	---	---	---	---	---
Aroclor 1254	11097-69-1	120	--	--		---	---	---	---	---	---	---	---	---	---	---
Aroclor 1260	11096-82-5	240	40	--		---	---	---	---	---	---	---	---	---	---	---
Total PCBs	1336-36-3	230	40	10000		---	---	---	---	---	---	---	---	---	---	---
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700	--	--		---	---	---	---	---	---	---	---	---	---	---
ANTIMONY	7440-36-0	3.1	2	10		---	---	---	---	---	---	---	---	---	---	---
ARSENIC	7440-38-2	0.68	7.24	7		**1.6** J	**2.4** J	**2.0** J	**2.3** J	**3.5** J	**2.8** J	**2.0** J	**3.1** J	**2.3** J	**1.3**	**2.0**
BARIUM	7440-39-3	1500	48	5500		**1.8** J	**3.8** J	**2.3** J	**2.3** J	**4.6** J	**2.4** J	**1.9** J	**2.5** J	**8.0** J	2.5 U	**3.1** J
BERYLLIUM	7440-41-7	16	--	0.4		---	---	---	---	---	---	---	---	---	---	---
CADMIUM	7440-43-9	7.1	0.68	39		0.3 UJ	0.4 UJ	0.3 UJ	0.5 UJ	0.3 UJ	0.3 UJ	0.4 UJ	0.3 UJ	0.4 UJ	0.2 U	0.2 U
CALCIUM	7440-70-2	--	--	--		---	---	---	---	---	---	---	---	---	---	---
CHROMIUM	7440-47-3	12000	52.3	1400/390		**1.9** J	**8.2** J	**1.9** J	**4.3** J	**3.3** J	**4.5** J	**2.4** J	**2.9** J	**3.9** J	**3.3** J	**2.5** J
HEXAVALENT CHROMIUM		--	--	--		---	---	---	---	---	---	---	---	---	0.36 UJ	0.37 UJ
COBALT	7440-48-4	2.3	10	--		---	---	---	---	---	---	---	---	---	---	---
COPPER	7440-50-8	310	18.7	--		---	---	---	---	---	---	---	---	---	---	---
IRON	7439-89-6	5500	--	--		---	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	400	30.2	--		**3.7** J	**12.7** J	**6.5** J	**5.9** J	**8.4** J	**7.9** J	**5.7** J	**7.1** J	**4.3** J	**5.3** J	**7.2** J
MAGNESIUM	7439-95-4	--	--	--		---	---	---	---	---	---	---	---	---	---	---
MANGANESE	7439-96-5	180	260	390		---	---	---	---	---	---	---	---	---	---	---
MERCURY	7439-97-6	1.1	0.13	23		0.011 U	0.016 U	0.011 U	0.013 U	0.011 U	0.014 U	0.011 U	0.013 U	0.017 U	0.025 U	0.026 U
NICKEL	7440-02-0	150	15.9	--		---	---	---	---	---	---	---	---	---	---	---
POTASSIUM	7440-09-7	--	--	--		---	---	---	---	---	---	---	---	---	---	---
SELENIUM	7782-49-2	39	1	390		3.1 UJ	4.7 UJ	4.1 UJ	6 UJ	3.6 UJ	4.1 UJ	5.3 UJ	3.3 UJ	4.9 UJ	0.50 U	0.49 U
SILVER	7440-22-4	39	0.73	--		0.3 UJ	0.4 UJ	0.3 UJ	0.5 UJ	0.3 UJ	0.3 UJ	0.4 UJ	0.3 UJ	0.4 UJ	0.25 U	0.25 U
SODIUM	7440-23-5	--	--	--		---	---	---	---	---	---	---	---	---	---	---
THALLIUM	7440-28-0	0.078	--	5.5		---	---	---	---	---	---	---	---	---	---	---
VANADIUM	7440-62-2	39	57	550		---	---	---	---	---	---	---	---	---	---	---
ZINC	7440-66-6	2300	124	6000		---	---	---	---	---	---	---	---	---	---	---
TOC (mg/kg)																
TOTAL ORGANIC CARBON (TOC)		--	--	--		**2610**	**12000**	**3020**	**3080**	**5980**	**11500**	**10200**	**5270**	**4070**	**2030**	**2010**

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Region III BTAG sediment screening values (USEPA, 2006)
b) NOAA Screening Quick Reference Table values (Buchman, 2008)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

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Table 5-9
Summary of Sediment Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-OFF-1	SED-OFF-2	SED-OFF-3	SED-OFF-4	SED-OFF-5	SED-OFF-6	SED-OFF-7	SED-OFF-8	SED-OFF-9	SED-OFF-10	
				SAMPLE ID	SED-OFF-1-083115	SED-OFF-2-083115	SED-OFF-3-083115	SED-OFF-4-083115	SED-OFF-5-083115	SED-OFF-6-083115	SED-OFF-7-090115	SED-OFF-8-090115	SED-OFF-9-090115	SED-OFF-10-090115	SED-OFF-10X-090115
				SAMPLE DATE	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15
				QC IDENTIFIER											
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**											
VOCs (µg/kg)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	--	2200	0.70 UJ	0.64 UJ	0.63 UJ	0.63 UJ	0.58 UJ	0.62 UJ	0.68 UJ	0.57 UJ	0.62 UJ	0.59 UJ	0.66 UJ
1,1,1-TRICHLOROETHANE	71-55-6	810000	--	540000	0.35 U	0.32 U	0.32 U	0.32 U	0.29 U	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	--	--	0.35 U	0.32 U	0.32 U	0.32 U	0.29 U	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U
1,1,2-TRICHLOROETHANE	79-00-5	150	--	3600	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
1,1-DICHLOROETHANE	75-34-3	3600	--	920000	0.35 UJ	0.32 UJ	0.32 UJ	0.32 UJ	0.29 UJ	0.31 UJ	0.34 UJ	0.29 UJ	0.31 UJ	0.29 UJ	0.33 UJ
1,1-DICHLOROETHENE	75-35-4	23000	--	200	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
1,1-DICHLOROPROPENE	563-58-6	--	--	--	0.35 U	0.32 U	0.32 U	0.32 U	0.29 U	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U
1,2,3-TRICHLOROBENZENE	87-61-6	6300	--	--	0.70 UJ	0.64 UJ	0.63 UJ	0.63 UJ	0.58 UJ	0.62 UJ	0.68 UJ	0.57 UJ	0.62 UJ	0.59 UJ	0.66 UJ
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	--	--	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
1,2,4-TRICHLOROBENZENE	120-82-1	5800	473	96000	0.70 UJ	0.64 UJ	0.63 UJ	0.63 UJ	0.58 UJ	0.62 UJ	0.68 UJ	0.57 UJ	0.62 UJ	0.59 UJ	0.66 UJ
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	--	--	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	--	--	1.4 U	1.3 U	1.3 U	1.3 U	1.2 U	1.2 U	1.4 U	1.1 U	1.2 U	1.2 U	1.3 U
1,2-DIBROMOETHANE	106-93-4	36	--	10	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
1,2-DICHLOROBENZENE	95-50-1	180000	16.5	--	0.35 UJ	0.32 UJ	0.32 UJ	0.32 UJ	0.29 UJ	0.31 UJ	0.34 UJ	0.29 UJ	0.31 UJ	0.29 UJ	0.33 UJ
1,2-DICHLOROETHANE	107-06-2	460	--	900	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
1,2-DICHLOROPROPANE	78-87-5	1600	--	1900	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	--	--	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
1,3-DICHLOROBENZENE	541-73-1	--	842	--	0.35 UJ	0.32 UJ	0.32 UJ	0.32 UJ	0.29 UJ	0.31 UJ	0.34 UJ	0.29 UJ	0.31 UJ	0.29 UJ	0.33 UJ
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
1,4-DICHLOROBENZENE	106-46-7	2600	460	--	0.35 UJ	0.32 UJ	0.32 UJ	0.32 UJ	0.29 UJ	0.31 UJ	0.34 UJ	0.29 UJ	0.31 UJ	0.29 UJ	0.33 UJ
2,2-DICHLOROPROPANE	594-20-7	--	--	--	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
2-BUTANONE (MEK)	78-93-3	2700000	--	--	3.5 U	3.2 U	3.2 U	3.2 U	2.9 U	3.1 U	3.4 U	2.9 U	3.1 U	2.9 U	3.3 U
2-CHLOROTOLUENE	95-49-8	160000	--	--	0.70 UJ	0.64 UJ	0.63 UJ	0.63 UJ	0.58 UJ	0.62 UJ	0.68 UJ	0.57 UJ	0.62 UJ	0.59 UJ	0.66 UJ
2-HEXANONE	591-78-6	20000	--	--	1.4 U	1.3 U	1.3 U	1.3 U	1.2 U	1.2 U	1.4 U	1.1 U	1.2 U	1.2 U	1.3 U
4-CHLOROTOLUENE	106-43-4	160000	--	--	0.70 UJ	0.64 UJ	0.63 UJ	0.63 UJ	0.58 UJ	0.62 UJ	0.68 UJ	0.57 UJ	0.62 UJ	0.59 UJ	0.66 UJ
4-ISOPROPYLTOLUENE	99-87-6	190000	--	--	0.35 UJ	0.32 UJ	0.32 UJ	0.32 UJ	0.29 UJ	0.31 UJ	0.34 UJ	0.29 UJ	0.31 UJ	0.29 UJ	0.33 UJ
4-METHYL-2-PENTANONE	108-10-1	3300000	--	--	1.4 U	1.3 U	1.3 U	1.3 U	1.2 U	1.2 U	1.4 U	1.1 U	1.2 U	1.2 U	1.3 U
ACETONE	67-64-1	6100000	--	7800000	3.5 U	**15.2**	**13.7**	**10.0**	**10.2**	**15.3**	3.4 U	**12.7**	**7.4**	**7.5**	**11.7**
BENZENE	71-43-2	1200	--	2500	0.35 UJ	0.32 UJ	0.32 UJ	0.32 UJ	0.29 UJ	0.31 UJ	0.34 UJ	0.29 UJ	0.31 UJ	0.29 UJ	0.33 UJ
BROMOBENZENE	108-86-1	29000	--	--	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
BROMOMETHANE	74-83-9	--	--	800	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
BROMOCHLOROMETHANE	74-97-5	15000	--	--	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
BROMODICHLOROMETHANE	75-27-4	290	--	10000	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
BROMOFORM	75-25-2	19000	--	81000	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
CARBON DISULFIDE	75-15-0	77000	--	--	**11.4**	**8.4**	**7.9**	**9.3**	**10.5**	**9.6**	**2.8 J**	**2.3 J**	**2.9 J**	**2.6 J**	**7.3**
CARBON TETRACHLORIDE	56-23-5	650	--	1500	0.35 U	0.32 U	0.32 U	0.32 U	0.29 U	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U
CHLOROBENZENE	108-90-7	28000	--	210000	0.35 UJ	0.32 UJ	0.32 UJ	0.32 UJ	0.29 UJ	0.31 UJ	0.34 UJ	0.29 UJ	0.31 UJ	0.29 UJ	0.33 UJ
CHLOROETHANE	75-00-3	1400000	--	--	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
CHLOROFORM	67-66-3	320	--	1200	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
CHLOROMETHANE	74-87-3	11000	--	--	1.4 U	1.3 U	1.3 U	1.3 U	1.2 U	1.2 U	1.4 U	1.1 U	1.2 U	1.2 U	1.3 U
CIS-1,2-DICHLOROETHENE	156-59-2	16000	--	630000	0.35 U	0.32 U	0.32 U	0.32 U	**0.29** J	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	--	--	0.35 U	0.32 U	0.32 U	0.32 U	0.29 U	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
DIBROMOMETHANE	74-95-3	2400	--	--	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
DICHLORODIFLUOROMETHANE	75-71-8	8700	--	--	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
ETHYLBENZENE	100-41-4	5800	--	71000	0.70 UJ	0.64 UJ	0.63 UJ	0.63 UJ	0.58 UJ	0.62 UJ	0.68 UJ	0.57 UJ	0.62 UJ	0.59 UJ	0.66 UJ
HEXACHLOROBUTADIENE	87-68-3	1200	--	--	0.70 UJ	0.64 UJ	0.63 UJ	0.63 UJ	0.58 UJ	0.62 UJ	0.68 UJ	0.57 UJ	0.62 UJ	0.59 UJ	0.66 UJ
ISOPROPYLBENZENE	98-82-8	190000	86	--	0.35 UJ	0.32 UJ	0.32 UJ	0.32 UJ	0.29 UJ	0.31 UJ	0.34 UJ	0.29 UJ	0.31 UJ	0.29 UJ	0.33 UJ
METHYL BROMIDE	74-83-9	--	--	800	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
METHYLENE CHLORIDE	75-09-2	35000	--	45000	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
NAPHTHALENE	91-20-3	3800	34.6	54000	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
N-BUTYL BENZENE	104-51-8	390000	--	--	0.35 U	0.32 U	0.32 U	0.32 U	0.29 U	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U
N-PROPYL BENZENE	103-65-1	380000	--	--	0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	--	--	--	0.35 UJ	0.32 UJ	0.32 UJ	0.32 UJ	0.29 UJ	0.31 UJ	0.34 UJ	0.29 UJ	0.31 UJ	0.29 UJ	0.33 UJ
SEC-BUTYL BENZENE	135-98-8	780000	137	--	0.35 U	0.32 U	0.32 U	0.32 U	0.29 U	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U
STYRENE	100-42-5	600000	--	13000	0.35 UJ	0.32 UJ	0.32 UJ	0.32 UJ	0.29 UJ	0.31 UJ	0.34 UJ	0.29 UJ	0.31 UJ	0.29 UJ	0.33 UJ
TERT-BUTYLBENZENE	98-06-6	780000	137	--	0.35 U	0.32 U	0.32 U	0.32 U	0.29 U	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U

Table 5-9
Summary of Sediment Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

					SAMPLE LOCATION	SED-OFF-1	SED-OFF-2	SED-OFF-3	SED-OFF-4	SED-OFF-5	SED-OFF-6	SED-OFF-7	SED-OFF-8	SED-OFF-9	SED-OFF-10	
					SAMPLE ID	SED-OFF-1-083115	SED-OFF-2-083115	SED-OFF-3-083115	SED-OFF-4-083115	SED-OFF-5-083115	SED-OFF-6-083115	SED-OFF-7-090115	SED-OFF-8-090115	SED-OFF-9-090115	SED-OFF-10-090115	SED-OFF-10X-090115
					SAMPLE DATE	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15
					QC IDENTIFIER											
VOCs (µg/kg)																
TETRACHLOROETHENE	127-18-4	8100	--	--		0.35 U	0.32 U	0.32 U	0.32 U	0.29 U	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U
TOLUENE	108-88-3	490000	1090	190000		0.35 U	0.32 U	0.32 U	0.32 U	0.29 U	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	--	1100000		0.35 U	0.32 U	0.32 U	0.32 U	0.29 U	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	--	--		0.35 U	0.32 U	0.32 U	0.32 U	0.29 U	0.31 U	0.34 U	0.29 U	0.31 U	0.29 U	0.33 U
TRICHLOROETHYLENE	79-01-6	410	--	13000		0.35 UJ	0.32 UJ	0.32 UJ	0.32 UJ	0.29 UJ	0.31 UJ	0.34 UJ	0.29 UJ	0.31 UJ	0.29 UJ	0.33 UJ
TRICHLOROFLUOROMETHANE	75-69-4	2300000	--	--		0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
VINYL CHLORIDE	75-01-4	59	--	20		0.70 U	0.64 U	0.63 U	0.63 U	0.58 U	0.62 U	0.68 U	0.57 U	0.62 U	0.59 U	0.66 U
XYLENE O	95-47-6	65000	--	--		0.35 UJ	0.32 UJ	0.32 UJ	0.32 UJ	0.29 UJ	0.31 UJ	0.34 UJ	0.29 UJ	0.31 UJ	0.29 UJ	0.33 UJ
XYLENE P,M	179601-23-1	--	--	--		0.70 UJ	0.64 UJ	0.63 UJ	0.63 UJ	0.58 UJ	0.62 UJ	0.68 UJ	0.57 UJ	0.62 UJ	0.59 UJ	0.66 UJ
PCBs (µg/kg)																
Aroclor 1016	12674-11-2	410	--	--		---	---	---	---	---	---	---	---	---	---	---
Aroclor 1221	11104-28-2	200	--	--		---	---	---	---	---	---	---	---	---	---	---
Aroclor 1232	11141-16-5	170	--	--		---	---	---	---	---	---	---	---	---	---	---
Aroclor 1242	53469-21-9	230	--	--		---	---	---	---	---	---	---	---	---	---	---
Aroclor 1248	12672-29-6	230	--	--		---	---	---	---	---	---	---	---	---	---	---
Aroclor 1254	11097-69-1	120	--	--		---	---	---	---	---	---	---	---	---	---	---
Aroclor 1260	11096-82-5	240	40	--		---	---	---	---	---	---	---	---	---	---	---
Total PCBs	1336-36-3	230	40	10000		---	---	---	---	---	---	---	---	---	---	---
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700	--	--		---	---	---	---	---	---	---	---	---	---	---
ANTIMONY	7440-36-0	3.1	2	10		---	---	---	---	---	---	---	---	---	---	---
ARSENIC	7440-38-2	0.68	7.24	7		**1.3**	**1.0**	**1.1**	**1.3**	**1.2**	**1.3**	**0.94**	**1.2**	**1.1**	**1.5**	**1.5**
BARIUM	7440-39-3	1500	48	5500		2.5 U	2.3 U	2.4 U	2.4 U	2.4 U	2.4 U	2.3 U	2.5 U	**7.6**	**2.4** J	**2.6** J
BERYLLIUM	7440-41-7	16	--	0.4		---	---	---	---	---	---	---	---	---	---	---
CADMIUM	7440-43-9	7.1	0.68	39		0.20 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U
CALCIUM	7440-70-2	--	--	--		---	---	---	---	---	---	---	---	---	---	---
CHROMIUM	7440-47-3	12000	52.3	1400/390		**3.3**	**5.2**	**2.8**	**3.8**	**3.2**	**2.9**	**2.6**	**2.8**	**18.2**	**4.3**	**5.3**
HEXAVALENT CHROMIUM		--	--	--		---	---	---	---	---	---	---	---	---	0.41 UJ	0.42 UJ
COBALT	7440-48-4	2.3	10	--		---	---	---	---	---	---	---	---	---	---	---
COPPER	7440-50-8	310	18.7	--		---	---	---	---	---	---	---	---	---	---	---
IRON	7439-89-6	5500	--	--		---	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	400	30.2	--		**4.3** J	**3.1** J	**2.7** J	**3.4** J	**2.9** J	**3.0** J	**4.0** J	**3.8** J	**4.7** J	**5.2** J	**4.4** J
MAGNESIUM	7439-95-4	--	--	--		---	---	---	---	---	---	---	---	---	---	---
MANGANESE	7439-96-5	180	260	390		---	---	---	---	---	---	---	---	---	---	---
MERCURY	7439-97-6	1.1	0.13	23		0.025 U	0.025 U	0.026 U	0.027 U	0.030 U	0.026 U	0.026 U	0.028 U	0.025 U	0.028 U	0.027 U
NICKEL	7440-02-0	150	15.9	--		---	---	---	---	---	---	---	---	---	---	---
POTASSIUM	7440-09-7	--	--	--		---	---	---	---	---	---	---	---	---	---	---
SELENIUM	7782-49-2	39	1	390		0.49 U	0.46 U	0.48 U	0.47 U	0.47 U	0.49 U	0.46 U	0.50 U	0.47 U	0.46 U	0.50 U
SILVER	7440-22-4	39	0.73	--		0.25 U	0.23 U	0.24 U	0.24 U	0.24 U	0.24 U	0.23 U	0.25 U	0.24 U	0.23 U	0.25 U
SODIUM	7440-23-5	--	--	--		---	---	---	---	---	---	---	---	---	---	---
THALLIUM	7440-28-0	0.078	--	5.5		---	---	---	---	---	---	---	---	---	---	---
VANADIUM	7440-62-2	39	57	550		---	---	---	---	---	---	---	---	---	---	---
ZINC	7440-66-6	2300	124	6000		---	---	---	---	---	---	---	---	---	---	---
TOC (mg/kg)																
TOTAL ORGANIC CARBON (TOC)		--	--	--		**3030**	**2610**	**2550**	**3290**	**2560**	**3960**	**4490**	**2400**	**3200**	**2880**	**2090**

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Region III BTAG sediment screening values (USEPA, 2006)
b) NOAA Screening Quick Reference Table values (Buchman, 2008)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

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Table 5-9
Summary of Sediment Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-301		SED-302	SED-303	SED-304	SED-305	SED-306	SED-307	SED-308	SED-309	SED-310
				SAMPLE ID	SED-301-CI19-0-1	SED-301-CI19-0-1-DUP	SED-302-CI19-0-1	SED-303-CI19-0-1	SED-304-CI19-0-1	SED-305-CI19-0-1	SED-306-CI19-0-1	SED-307-CI19-0-1	SED-308-CI19-0-1	SED-309-CI19-0-1	SED-310-CI19-0-1
				SAMPLE DATE	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19
				QC IDENTIFIER	DUPLICATE	DUPLICATE									
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**											
VOCs (µg/kg)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	2000	--	2200	---	---	---	---	---	---	---	---	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	810000	--	540000	---	---	---	---	---	---	---	---	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	600	--	--	---	---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	150	--	3600	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHANE	75-34-3	3600	--	920000	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROETHENE	75-35-4	23000	--	200	---	---	---	---	---	---	---	---	---	---	---
1,1-DICHLOROPROPENE	563-58-6	--	--	--	---	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	6300	--	--	---	---	---	---	---	---	---	---	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	5.1	--	--	---	---	---	---	---	---	---	---	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5800	473	96000	---	---	---	---	---	---	---	---	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	30000	--	--	---	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	5.3	--	--	---	---	---	---	---	---	---	---	---	---	---
1,2-DIBROMOETHANE	106-93-4	36	--	10	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	180000	16.5	--	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROETHANE	107-06-2	460	--	900	---	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROPROPANE	78-87-5	1600	--	1900	---	---	---	---	---	---	---	---	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	27000	--	--	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	--	842	--	---	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROPROPANE	142-28-9	160000	--	--	---	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	2600	460	--	---	---	---	---	---	---	---	---	---	---	---
2,2-DICHLOROPROPANE	594-20-7	--	--	--	---	---	---	---	---	---	---	---	---	---	---
2-BUTANONE (MEK)	78-93-3	2700000	--	--	---	---	---	---	---	---	---	---	---	---	---
2-CHLOROTOLUENE	95-49-8	160000	--	--	---	---	---	---	---	---	---	---	---	---	---
2-HEXANONE	591-78-6	20000	--	--	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROTOLUENE	106-43-4	160000	--	--	---	---	---	---	---	---	---	---	---	---	---
4-ISOPROPYLTOLUENE	99-87-6	190000	--	--	---	---	---	---	---	---	---	---	---	---	---
4-METHYL-2-PENTANONE	108-10-1	3300000	--	--	---	---	---	---	---	---	---	---	---	---	---
ACETONE	67-64-1	6100000	--	7800000	---	---	---	---	---	---	---	---	---	---	---
BENZENE	71-43-2	1200	--	2500	---	---	---	---	---	---	---	---	---	---	---
BROMOBENZENE	108-86-1	29000	--	--	---	---	---	---	---	---	---	---	---	---	---
BROMOMETHANE	74-83-9	--	--	800	---	---	---	---	---	---	---	---	---	---	---
BROMOCHLOROMETHANE	74-97-5	15000	--	--	---	---	---	---	---	---	---	---	---	---	---
BROMODICHLOROMETHANE	75-27-4	290	--	10000	---	---	---	---	---	---	---	---	---	---	---
BROMOFORM	75-25-2	19000	--	81000	---	---	---	---	---	---	---	---	---	---	---
CARBON DISULFIDE	75-15-0	77000	--	--	---	---	---	---	---	---	---	---	---	---	---
CARBON TETRACHLORIDE	56-23-5	650	--	1500	---	---	---	---	---	---	---	---	---	---	---
CHLOROBENZENE	108-90-7	28000	--	210000	---	---	---	---	---	---	---	---	---	---	---
CHLOROETHANE	75-00-3	1400000	--	--	---	---	---	---	---	---	---	---	---	---	---
CHLOROFORM	67-66-3	320	--	1200	---	---	---	---	---	---	---	---	---	---	---
CHLOROMETHANE	74-87-3	11000	--	--	---	---	---	---	---	---	---	---	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	16000	--	630000	---	---	---	---	---	---	---	---	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	--	--	--	---	---	---	---	---	---	---	---	---	---	---
DIBROMOCHLOROMETHANE	124-48-1	8300	--	7600	---	---	---	---	---	---	---	---	---	---	---
DIBROMOMETHANE	74-95-3	2400	--	--	---	---	---	---	---	---	---	---	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8	8700	--	--	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	5800	--	71000	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBUTADIENE	87-68-3	1200	--	--	---	---	---	---	---	---	---	---	---	---	---
ISOPROPYLBENZENE	98-82-8	190000	86	--	---	---	---	---	---	---	---	---	---	---	---
METHYL BROMIDE	74-83-9	--	--	800	---	---	---	---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	47000	--	390000	---	---	---	---	---	---	---	---	---	---	---
METHYLENE CHLORIDE	75-09-2	35000	--	45000	---	---	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	3800	34.6	54000	---	---	---	---	---	---	---	---	---	---	---
N-BUTYL BENZENE	104-51-8	390000	--	--	---	---	---	---	---	---	---	---	---	---	---
N-PROPYL BENZENE	103-65-1	380000	--	--	---	---	---	---	---	---	---	---	---	---	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	--	--	--	---	---	---	---	---	---	---	---	---	---	---
SEC-BUTYL BENZENE	135-98-8	780000	137	--	---	---	---	---	---	---	---	---	---	---	---
STYRENE	100-42-5	600000	--	13000	---	---	---	---	---	---	---	---	---	---	---
TERT-BUTYLBENZENE	98-06-6	780000	137	--	---	---	---	---	---	---	---	---	---	---	---

Table 5-9
Summary of Sediment Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

					SAMPLE LOCATION	SED-301		SED-302	SED-303	SED-304	SED-305	SED-306	SED-307	SED-308	SED-309	SED-310
					SAMPLE ID	SED-301-CI19-0-1	SED-301-CI19-0-1-DUP	SED-302-CI19-0-1	SED-303-CI19-0-1	SED-304-CI19-0-1	SED-305-CI19-0-1	SED-306-CI19-0-1	SED-307-CI19-0-1	SED-308-CI19-0-1	SED-309-CI19-0-1	SED-310-CI19-0-1
					SAMPLE DATE	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19	03-Oct-19
					QC IDENTIFIER	DUPLICATE	DUPLICATE									
VOCs (µg/kg)																
TETRACHLOROETHENE	127-18-4	8100	--	--		---	---	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	490000	1090	190000		---	---	---	---	---	---	---	---	---	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	160000	--	1100000		---	---	---	---	---	---	---	---	---	---	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	--	--	--		---	---	---	---	---	---	---	---	---	---	---
TRICHLOROETHYLENE	79-01-6	410	--	13000		---	---	---	---	---	---	---	---	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4	2300000	--	--		---	---	---	---	---	---	---	---	---	---	---
VINYL CHLORIDE	75-01-4	59	--	20		---	---	---	---	---	---	---	---	---	---	---
XYLENE O	95-47-6	65000	--	--		---	---	---	---	---	---	---	---	---	---	---
XYLENE P,M	179601-23-1	--	--	--		---	---	---	---	---	---	---	---	---	---	---
PCBs (µg/kg)																
Aroclor 1016	12674-11-2	410	--	--		9.2 U	8.7 U	8.8 U	8.4 U	9.1 U	9.1 U	9.2 U	8.7 U	8.7 U	8.9 U	9.4 U
Aroclor 1221	11104-28-2	200	--	--		9.2 U	8.7 U	8.8 U	8.4 U	9.1 U	9.1 U	9.2 U	8.7 U	8.7 U	8.9 U	9.4 U
Aroclor 1232	11141-16-5	170	--	--		11 U	10 U	10 U	9.9 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
Aroclor 1242	53469-21-9	230	--	--		9.2 U	8.7 U	8.8 U	8.4 U	9.1 U	9.1 U	9.2 U	8.7 U	8.7 U	8.9 U	9.4 U
Aroclor 1248	12672-29-6	230	--	--		9.2 U	8.7 U	8.8 U	8.4 U	9.1 U	9.1 U	9.2 U	8.7 U	8.7 U	8.9 U	9.4 U
Aroclor 1254	11097-69-1	120	--	--		9.2 U	8.7 U	8.8 U	8.4 U	9.1 U	9.1 U	9.2 U	8.7 U	8.7 U	8.9 U	9.4 U
Aroclor 1260	11096-82-5	240	40	--		**17 J**	**15 J**	**17 J**	**24**	**20**	**19**	**19**	**16 J**	**17**	**22**	**25**
Total PCBs	1336-36-3	230	40	10000		**17 J**	**15** J	**17 J**	**24 J**	**20 J**	**19 J**	**19 J**	**16 J**	**17 J**	**22 J**	**25 J**
METALS (mg/kg)																
ALUMINUM	7429-90-5	7700	--	--		**2310**	**2250**	**1890**	**2320**	**1780**	**10600**	**2250**	**2330**	**1820**	**1780**	**1620**
ANTIMONY	7440-36-0	3.1	2	10		**0.017 J**	**0.018 J**	**0.029 J**	**0.03 J**	**0.019 J**	**0.022 J**	**0.025 J**	**0.043**	0.042 U	**0.054 J**	**0.039 J**
ARSENIC	7440-38-2	0.68	7.24	7		**1.0**	**1.1**	**1.2**	**1.1**	**0.93**	**1.5 J**	**1.47**	**1.24**	**0.96**	**0.97**	**1.2**
BARIUM	7440-39-3	1500	48	5500		**7.45 J**	**3.48 J**	**2.76**	**3.96**	**4.32**	**3.15**	**2.87**	**3.50**	**3.88**	**3.06**	**2.99**
BERYLLIUM	7440-41-7	16	--	0.4		**0.225**	**0.214**	**0.183**	**0.218**	**1.58**	**0.372**	**0.211**	**0.291**	**0.271**	**0.180**	**0.259**
CADMIUM	7440-43-9	7.1	0.68	39		**0.015 J**	**0.017 J**	**0.016 J**	**0.018 J**	**0.014 J**	**0.0909**	**0.028 J**	**0.018 J**	**0.016 J**	**0.016 J**	**0.023 J**
CALCIUM	7440-70-2	--	--	--		**315**	**244**	**280**	**240**	**225**	**518 J**	**352**	**344**	**295**	**243**	**289**
CHROMIUM	7440-47-3	12000	52.3	1400/390		**2.20**	**2.96**	**3.94**	**3.48**	**7.18**	**11.7 J**	**4.12**	**6.07**	**4.37**	**9.79**	**3.85**
HEXAVALENT CHROMIUM		--	--	--		---	---	---	---	---	---	---	---	---	---	---
COBALT	7440-48-4	2.3	10	--		**1.24**	**1.50**	**1.08**	**1.29**	**1.74**	**3.92**	**1.45**	**1.70**	**1.02**	**1.09**	**1.12**
COPPER	7440-50-8	310	18.7	--		**2.15**	**2.95**	**2.53**	**11.4**	**14.1**	**12.9 J**	**3.78**	**8.30**	**3.12**	**2.49**	**7.02**
IRON	7439-89-6	5500	--	--		**5050**	**4380**	**4480**	**4620**	**3960**	**17200 J**	**4680**	**5780**	**4470**	**4620**	**4420**
LEAD	7439-92-1	400	30.2	--		**4.32**	**4.16**	**7.91**	**20.8**	**15.4**	**13.2 J**	**5.79**	**12.3**	**5.15**	**4.40**	**10.3**
MAGNESIUM	7439-95-4	--	--	--		**974**	**1030**	**918**	**1010**	**636**	**4390**	**1030**	**961**	**813**	**738**	**714**
MANGANESE	7439-96-5	180	260	390		**74.3**	**50.8**	**47.6**	**46.6**	**47.1**	**233 J**	**50.0**	**61.2**	**53.9**	**55.3**	**55.4**
MERCURY	7439-97-6	1.1	0.13	23		0.019 U	0.018 U	**0.0058** J	0.016 U	0.016 U	0.018 U	0.018 U	**0.0053** J	0.019 U	0.018 U	0.017 U
NICKEL	7440-02-0	150	15.9	--		**2.46**	**2.76**	**2.82**	**7.42**	**6.89**	**8.10 J**	**4.19**	**6.08**	**3.01**	**6.53**	**5.08**
POTASSIUM	7440-09-7	--	--	--		**792** J	**390 J**	**330**	**405**	**280**	**297**	**322**	**301**	**430**	**362**	**296**
SELENIUM	7782-49-2	39	1	390		0.26 U	0.24 U	0.29 U	0.19 U	**0.042** J	**0.059** J	0.22 U	**0.032** J	0.25 U	0.21 U	0.25 U
SILVER	7440-22-4	39	0.73	--		**0.010 J**	**0.0085 J**	**0.0094 J**	**0.0092 J**	**0.012 J**	**0.011 J**	**0.0098 J**	**0.014 J**	**0.0073 J**	**0.0085 J**	**0.012 J**
SODIUM	7440-23-5	--	--	--		**1110**	**1040**	**1300**	**868**	**818**	**832**	**1100**	**1060**	**1340**	**1030**	**999**
THALLIUM	7440-28-0	0.078	--	5.5		**0.038 J**	**0.032 J**	**0.023 J**	**0.035 J**	**0.022 J**	**0.027 J**	**0.030 J**	**0.024 J**	**0.031 J**	**0.030 J**	**0.022 J**
VANADIUM	7440-62-2	39	57	550		**5.35**	**4.30**	**3.78**	**4.72**	**3.00**	**10.3 J**	**4.53**	**6.77**	**4.52**	**4.02**	**4.15**
ZINC	7440-66-6	2300	124	6000		**21.2**	**21.5**	**22.0**	**20.5**	**64.0**	**44.1 J**	**22.4**	**39.0**	**18.0**	**17.2**	**33.8**
TOC (mg/kg)																
TOTAL ORGANIC CARBON (TOC)		--	--	--		**5000 J**	**2800 J**	**4000 U**	**3300 UJ**	**10000 U**	**3200 J**	---	---	---	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Region III BTAG sediment screening values (USEPA, 2006)
b) NOAA Screening Quick Reference Table values (Buchman, 2008)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

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Table 5-10
Summary of Sediment Analytical Data - Off-Site Beachfront Background
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SED-311		SED-312	SED-313	SED-314	SED-315	SED-316	SED-317	SED-318	SED-319	SED-320
				SAMPLE ID	SED-311-CI20-0-1	SED-311-CI20-0-1-DUP	SED-312-CI20-0-1	SED-313-CI20-0-1	SED-314-CI20-0-1	SED-315-CI20-0-1	SED-316-CI20-0-1	SED-317-CI20-0-1	SED-318-CI20-0-1	SED-319-CI20-0-1	SED-320-CI20-0-1
				SAMPLE DATE	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20	22-May-20
				QC IDENTIFIER	DUPLICATE	DUPLICATE									
ANALYTE	**CAS**	**HH**	**ECO**	**RIDEM Res.**											
METALS (mg/kg)															
ALUMINUM	7429-90-5	7700	--	--	**3890**	**4680**	**4510**	**4820**	**3460**	**5450**	**7710**	**7040**	**6790**	**7600**	**4140**
ANTIMONY	7440-36-0	3.1	2	10	**0.12**	0.09 U	0.095 U	0.090 U	0.046 U	**0.10** UJ	0.098 U	0.094 U	0.092 U	0.092 U	0.12 U
ARSENIC	7440-38-2	0.68	7.24	7	**1.60**	**1.37**	**1.45**	**1.52**	**1.30**	**1.40**	**1.72**	**1.46**	**1.98**	**2.05**	**1.50**
BARIUM	7440-39-3	1500	48	5500	**6.57**	**5.87**	**5.90**	**5.84**	**4.59**	**16.0**	**25.2**	**23.0**	**20.8**	**7.73**	**9.96**
BERYLLIUM	7440-41-7	16	--	0.4	**0.663**	**0.694**	**0.759**	**0.624**	**0.510**	**0.938**	**0.636**	**0.514**	**0.919**	**0.752**	**0.559**
CADMIUM	7440-43-9	7.1	0.68	39	0.12 U	0.085 U	0.095 U	0.09 U	0.093 U	0.10 U	0.098 U	0.094 U	0.092 U	0.092 U	0.12 U
CALCIUM	7440-70-2	--	--	--	**13600 J**	**35800 J**	**6310**	**5550**	**2000**	**3040 J**	**2220**	**28800**	**5000**	**14400**	**1180**
CHROMIUM	7440-47-3	12000	52.3	1400/390	**5.36**	**4.74**	**5.44**	**6.76**	**4.46**	**8.54**	**9.69**	**11.1**	**9.96**	**8.98**	**5.16**
COBALT	7440-48-4	2.3	10	--	**4.16**	**3.30**	**4.28**	**3.25**	**2.81**	**4.25**	**4.97**	**4.34**	**7.69**	**4.44**	**2.45**
COPPER	7440-50-8	310	18.7	3100	**8.93**	**8.30**	**7.29**	**5.36**	**5.73**	**9.10**	**7.91**	**5.09**	**13.2**	**10.6**	**6.18**
IRON	7439-89-6	5500	--	--	**11400**	**11300**	**11700**	**12200**	**7740**	**13700**	**14000**	**12700**	**15000**	**15800**	**8540**
LEAD	7439-92-1	400	30.2	150	**7.94**	**7.96**	**8.10**	**5.52**	**4.18**	**7.47 J**	**7.67**	**7.36**	**7.49**	**7.51**	**4.34**
MAGNESIUM	7439-95-4	--	--	--	**1700**	**2060**	**1870**	**2250**	**1580**	**2110**	**3130**	**3830**	**2860**	**3840**	**1710**
MANGANESE	7439-96-5	180	260	390	**149**	**144**	**178**	**126**	**118**	**137**	**168**	**149**	**221**	**180**	**101**
MERCURY	7439-97-6	1.1	0.13	23	**0.0049 J**	**0.0094 J**	**0.0085 J**	**0.0069 J**	**0.0074 J**	**0.0066 J**	**0.011 J**	**0.020 J**	**0.014 J**	**0.010 J**	**0.0058 J**
NICKEL	7440-02-0	150	15.9	1000	**4.70**	**5.14**	**6.26**	**6.90**	**5.28**	**10.4**	**9.40**	**8.36**	**9.74**	**9.80**	**5.06**
POTASSIUM	7440-09-7	--	--	--	**692**	**705**	**686**	**615**	**523**	**1020 J**	**1780**	**1930**	**1420**	**1090**	**863**
SELENIUM	7782-49-2	39	1	390	**0.20 J**	**0.075 J**	**0.08 J**	**0.085 J**	**0.051 J**	**0.11 J**	**0.086 J**	**0.075 J**	**0.068 J**	**0.09 J**	**0.065 J**
SILVER	7440-22-4	39	0.73	200	**0.015 J**	**0.018 J**	**0.018 J**	**0.020 J**	**0.013 J**	**0.012 J**	**0.013 J**	**0.030 J**	**0.041 J**	**0.023 J**	**0.0079 J**
SODIUM	7440-23-5	--	--	--	**264 J**	**510 J**	**177**	**142**	**114**	**164**	**414**	**574**	**355**	**693**	**740**
THALLIUM	7440-28-0	0.078	--	5.5	0.12 U	0.085 U	0.095 U	0.09 U	0.093 U	0.10 U	**0.15**	**0.149**	**0.106**	**0.128**	0.12 U
VANADIUM	7440-62-2	39	57	550	**7.83**	**7.24**	**8.29**	**11.0**	**6.15**	**11.4**	**14.5**	**12.8**	**16.2**	**14.1**	**8.58**
ZINC	7440-66-6	2300	124	6000	**30.8**	**33.4**	**36.8**	**32.8**	**24.2**	**31.4**	**34.2**	**28.6**	**31.2**	**41.5**	**22.4**
TOC (mg/kg)															
TOTAL ORGANIC CARBON (TOC)		--	--	--	**14000 J**	**14000 J**	**6900 J**	**8500 J**	**9400 J**	**13000 J**	---	---	---	---	---

Notes:
1. Human health risk-based screening levels are EPA RSLs for Residential Soil.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA Region III BTAG sediment screening values (USEPA, 2006)
b) NOAA Screening Quick Reference Table values (Buchman, 2008)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Level
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level
Shaded = Exceeds RIDEM Residential Direct Exposure Criteria

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Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	BB-2		BB-3				BB-4		BMW-3		
				SITE LOCATION	KIEFER PARK		BLUE BEACH				BLUE BEACH		KIEFER PARK (LOCATED ON BLUE BEACH FUDS)		
				SAMPLE ID	BB-2-CI19	BB-2-CI19-F	BB-3-CI19	BB-3-CI19-DUP	BB-3-CI19-F	BB-3-CI19-F-DUP	BB-4-CI19	BB-4-CI19-F	BMW-3-A	BMW-3-CI19	BMW-3-CI19-F
				SAMPLE DATE	24-Oct-19	24-Oct-19	30-Oct-19	30-Oct-19	30-Oct-19	30-Oct-19	28-Oct-19	28-Oct-19	23-Jul-14	29-Oct-19	29-Oct-19
				QC IDENTIFIER			DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE					
ANALYTE	**CAS**	**RSL**	**MCL**	**RIDEM GA GW**											
VOCs (µg/L)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
1,1,1-TRICHLOROETHANE	71-55-6	800	200	200	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.076	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	---	0.5U	---
1,1,2-TRICHLOROETHANE	79-00-5	0.041	5	5	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
1,1-DICHLOROETHANE	75-34-3	2.8	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
1,1-DICHLOROETHENE	75-35-4	28	7	7	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
1,1-DICHLOROPROPENE	563-58-6	---	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
1,2,3-TRICHLOROBENZENE	87-61-6	0.7	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	---	0.5U	---	0.5U	7.1U	---	---	0.5U	---	0.5U	7.0U	---
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	---	---	**3.0**	---	**8.1**	**8.1**	---	---	**320J**	---	0.2U	0.5U	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	0.2	---	0.75U	---	0.75U	0.75U	---	---	0.75U	---	2.0U	0.75U	---
1,2-DIBROMOETHANE	106-93-4	---	---	0.05	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	---	7.3U	---	7.0U	0.5U	---	---	7.1U	---	0.2U	0.5U	---
1,2-DICHLOROETHANE	107-06-2	0.17	5	5	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
1,2-DICHLOROPROPANE	78-87-5	0.82	5	5	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	---	0.5U	---	7.0U	0.5U	---	---	7.1U	---	0.5U	7.0U	---
1,3-DICHLOROPROPANE	142-28-9	37	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	---	0.5U	---	7.0U	7.1U	---	---	0.5U	---	0.2U	7.0U	---
2,2-DICHLOROPROPANE	594-20-7	---	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
2-BUTANONE (MEK)	78-93-3	560	---	---	2.5U	---	2.5U	2.5U	---	---	2.5U	---	10U	2.5U	---
2-CHLOROTOLUENE	95-49-8	24	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
2-HEXANONE	591-78-6	3.8	---	---	2.5U	---	2.5U	2.5U	---	---	2.5U	---	5.0U	2.5U	---
4-CHLOROTOLUENE	106-43-4	25	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
4-ISOPROPYLTOLUENE	99-87-6	---	---	---	**0.33J**	---	**2.5**	**2.5**	---	---	**11J**	---	0.2U	0.5U	---
4-METHYL-2-PENTANONE	108-10-1	---	---	---	2.5U	---	2.5U	2.5U	---	---	2.5U	---	5.0U	2.5U	---
ACETONE	67-64-1	1400	---	---	**84**	---	**11**	**11**	---	---	5.0UJ	---	5.0U	2.5U	---
BENZENE	71-43-2	0.46	5	5	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
BROMOBENZENE	108-86-1	6.2	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
BROMOMETHANE	74-83-9	0.75	---	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---	1.0UJ	1.0U	---
BROMOCHLOROMETHANE	74-97-5	8.3	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
BROMODICHLOROMETHANE	75-27-4	0.13	80	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
BROMOFORM	75-25-2	3.3	80	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
CARBON DISULFIDE	75-15-0	81	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
CARBON TETRACHLORIDE	56-23-5	0.46	5	5	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
CHLOROBENZENE	108-90-7	7.8	100	100	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
CHLOROETHANE	75-00-3	2100	---	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---	1.0UJ	1.0U	---
CHLOROFORM	67-66-3	0.22	80	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
CHLOROMETHANE	74-87-3	19	---	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---	0.5U	1.0U	---
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	70	70	0.5U	---	0.5U	0.5U	---	---	0.5U	---	**3.1J**	**5.5**	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
DIBROMOCHLOROMETHANE	124-48-1	0.87	80	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
DIBROMOMETHANE	74-95-3	0.83	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
DICHLORODIFLUOROMETHANE	75-71-8	20	---	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---	1.0U	1.0U	---
DIISOPROPYL ETHER	108-20-3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	1.5	700	700	**0.24J**	---	**4.3**	**4.3**	---	---	**4.8J**	---	0.2U	0.5U	---
HEXACHLOROBUTADIENE	87-68-3	0.14	---	---	0.75U	---	0.75U	0.75U	---	---	0.75U	---	0.5U	0.75U	---
ISOPROPYLBENZENE	98-82-8	---	---	---	0.5U	---	**11**	**11**	---	---	**18J**	---	0.2U	0.5U	---
METHYL BROMIDE	74-83-9	---	---	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---	1.0UJ	1.0U	---
METHYL TERT-BUTYL ETHER	1634-04-4	---	---	40	0.5U	---	0.5U	0.5U	---	---	0.5U	---	1.0U	0.5U	---
METHYLENE CHLORIDE	75-09-2	11	5	5	2.5U	---	2.5U	2.5U	---	---	2.5U	---	0.5U	2.5U	---
NAPHTHALENE	91-20-3	0.17	---	20	0.097U	---	**160J**	**150J**	---	---	**250**	---	0.5U	0.093U	---
N-BUTYL BENZENE	104-51-8	---	---	---	0.5U	---	**2.4**	**2.5**	---	---	**6.3J**	---	0.2U	0.5U	---
N-PROPYL BENZENE	103-65-1	---	---	---	0.5U	---	**12**	**12**	---	---	**26J**	---	0.5U	0.5U	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	---	**0.33J**	---	**2.5**	**2.5**	---	---	**11J**	---	0.2U	0.5U	---
SEC-BUTYL BENZENE	135-98-8	---	---	---	0.5U	---	**4.4**	**4.4**	---	---	**8.9J**		0.2U	0.5U	---
STYRENE	100-42-5	120	100	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	BB-2		BB-3				BB-4		BMW-3		
				SITE LOCATION	KIEFER PARK		BLUE BEACH				BLUE BEACH		KIEFER PARK (LOCATED ON BLUE BEACH FUDS)		
				SAMPLE ID	BB-2-CI19	BB-2-CI19-F	BB-3-CI19	BB-3-CI19-DUP	BB-3-CI19-F	BB-3-CI19-F-DUP	BB-4-CI19	BB-4-CI19-F	BMW-3-A	BMW-3-CI19	BMW-3-CI19-F
				SAMPLE DATE	24-Oct-19	24-Oct-19	30-Oct-19	30-Oct-19	30-Oct-19	30-Oct-19	28-Oct-19	28-Oct-19	23-Jul-14	29-Oct-19	29-Oct-19
				QC IDENTIFIER			DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE					
ANALYTE	**CAS**	**RSL**	**MCL**	**RIDEM GA GW**											
VOCs (µg/L)															
TERT-BUTYLBENZENE	98-06-6	69	---	---	0.5U	---	**3.5**	**3.7**	---	---	**5.0J**	---	0.2U	0.5U	---
TETRACHLOROETHENE	127-18-4	4.1	5	5	0.5U	---	0.5U	0.5U	---	---	0.5U	---	**0.6J**	0.5U	---
TETRAHYDROFURAN	109-99-9	340	---	---	5.0U	---	5.0U	5.0U	---	---	5.0U	---	---	5.0U	---
TOLUENE	108-88-3	110	1000	1000	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
TRANS-1,2-DICHLOROETHENE	156-60-5	36	100	100	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.5U	0.5U	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	0.2U	0.5U	---
TRICHLOROETHYLENE	79-01-6	0.28	5	5	0.5U	---	0.5U	0.5U	---	---	0.5U	---	**4.0**	**28**	---
TRICHLOROFLUOROMETHANE	75-69-4	520	---	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---	0.5U	1.0U	---
VINYL CHLORIDE	75-01-4	0.019	2	2	1.0U	---	1.0U	1.0U	---	---	1.0U	---	0.5U	1.0U	---
XYLENE O	95-47-6	---	---	---	0.5U	---	0.5U	0.5U	---	---	**0.57J**	---	0.2U	0.5U	---
XYLENE P,M	179601-23-1	---	---	---	1.0U	---	1.0U	1.0U	---	---	**40J**	---	0.4U	1.0U	---
TOTAL XYLENES	1330-20-7	19	10000	10000	0.5U	---	0.5U	0.5U	---	---	**40.6J**	---	0.2U	0.5U	---
SVOC (µg/L)															
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	---	0.5U	---	0.5U	7.1U	---	---	0.5U	---	---	7.0U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	---	7.3U	---	7.0U	0.5U	---	---	7.1U	---	---	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	---	0.5U	---	7.0U	0.5U	---	---	7.1U	---	---	7.0U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	---	0.5U	---	7.0U	7.1U	---	---	0.5U	---	---	7.0U	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	71	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
2,4,5-TRICHLOROPHENOL	95-95-4	120	---	---	18U	---	18U	---	---	---	18U	---	---	18U	---
2,4,6-TRICHLOROPHENOL	88-06-2	1.2	---	---	7.3U	---	7.0U	---	---	---	7.1U	---	---	7.0U	---
2,4-DICHLOROPHENOL	120-83-2	4.6	---	---	7.3U	---	7.0U	---	---	---	7.1U	---	---	7.0U	---
2,4-DIMETHYLPHENOL	105-67-9	36	---	---	7.3U	---	7.0U	---	---	---	7.1U	---	---	7.0U	---
2,4-DINITROPHENOL	51-28-5	3.9	---	---	18U	---	18U	---	---	---	18U	---	---	18U	---
2,4-DINITROTOLUENE	121-14-2	0.24	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
2,6-DINITROTOLUENE	606-20-2	0.049	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
trans-1,3-Dichloropropene	10061-02-6	---	---	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---	---	0.5U	---
2-CHLORONAPHTHALENE	91-58-7	75	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
2-CHLOROPHENOL	95-57-8	9.1	---	---	7.3U	---	7.0U	---	---	---	7.1U	---	---	7.0U	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	93	---	---	7.3U	---	7.0U	---	---	---	7.1U	---	---	7.0U	---
2-NITROANILINE	88-74-4	19	---	---	18U	---	18U	18U	---	---	18U	---	---	18U	---
2-NITROPHENOL	88-75-5	---	---	---	7.3U	---	7.0U	---	---	---	7.1U	---	---	7.0U	---
3,3'-DICHLOROBENZIDINE	91-94-1	0.13	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
3-NITROANILINE	99-09-2	---	---	---	18U	---	18U	18U	---	---	18U	---	---	18U	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	0.15	---	---	18U	---	18U	---	---	---	18U	---	---	18U	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
4-CHLORO-3-METHYLPHENOL	59-50-7	140	---	---	7.3U	---	7.0U	---	---	---	7.1U	---	---	7.0U	---
4-CHLOROANILINE	106-47-8	0.37	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
4-NITROANILINE	100-01-6	3.8	---	---	18U	---	18U	18U	---	---	18U	---	---	18U	---
4-NITROPHENOL	100-02-7	---	---	---	18UJ	---	18UJ	---	---	---	18UJ	---	---	18UJ	---
BENZOIC ACID	65-85-0	7500	---	---	18UJ	---	18UJ	---	---	---	18UJ	---	---	18UJ	---
BENZYL ALCOHOL	100-51-6	200	---	---	14U	---	14U	14U	---	---	14U	---	---	14U	---
BENZYL BUTYL PHTHALATE	85-68-7	16	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	5.9	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	0.014	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	5.6	6	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
CARBAZOLE	86-74-8	---	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
CRESOLS, M- & P-		---	---	---	7.3U	---	7.0U	---	---	---	7.1U	---	---	7.0U	---
DIBENZOFURAN	132-64-9	0.79	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
DIETHYL PHTHALATE	84-66-2	1500	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
DIMETHYL PHTHALATE	131-11-3	---	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
DI-N-BUTYL PHTHALATE	84-74-2	90	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
DI-N-OCTYL PHTHALATE	117-84-0	20	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
HEXACHLOROBENZENE	118-74-1	0.0098	1	1	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
HEXACHLOROETHANE	67-72-1	0.33	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
ISOPHORONE	78-59-1	78	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	BB-2		BB-3				BB-4		BMW-3		
				SITE LOCATION	KIEFER PARK		BLUE BEACH				BLUE BEACH		KIEFER PARK (LOCATED ON BLUE BEACH FUDS)		
				SAMPLE ID	BB-2-CI19	BB-2-CI19-F	BB-3-CI19	BB-3-CI19-DUP	BB-3-CI19-F	BB-3-CI19-F-DUP	BB-4-CI19	BB-4-CI19-F	BMW-3-A	BMW-3-CI19	BMW-3-CI19-F
				SAMPLE DATE	24-Oct-19	24-Oct-19	30-Oct-19	30-Oct-19	30-Oct-19	30-Oct-19	28-Oct-19	28-Oct-19	23-Jul-14	29-Oct-19	29-Oct-19
				QC IDENTIFIER			DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE					
ANALYTE	**CAS**	**RSL**	**MCL**	**RIDEM GA GW**											
SVOC (µg/L)															
NITROBENZENE	98-95-3	0.14	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
N-NITROSODIMETHYLAMINE	62-75-9	0.00011	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	0.011	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
N-NITROSODIPHENYLAMINE	86-30-6	12	---	---	7.3U	---	7.0U	7.1U	---	---	7.1U	---	---	7.0U	---
PENTACHLOROPHENOL	87-86-5	0.041	1	---	18U	---	18U	---	---	---	18U	---	---	18U	---
PHENOL	108-95-2	580	---	---	7.3UJ	---	7.0UJ	---	---	---	7.1UJ	---	---	7.0UJ	---
PAHs (µg/L)															
1-METHYLNAPHTHALENE	90-12-0	1.1	---	---	0.097U	---	**78J**	**70J**	---	---	**90**	---	---	0.093U	---
2-METHYLNAPHTHALENE	91-57-6	3.6	---	---	**0.076J**	---	**35J**	**28J**	---	---	**85**	---	---	0.093U	---
ACENAPHTHENE	83-32-9	53	---	---	0.097U	---	**0.18J**	**0.25J**	---	---	**0.16J**	---	---	0.093U	---
ACENAPHTHYLENE	208-96-8	---	---	---	0.097U	---	0.093U	0.094U	---	---	0.094U	---	---	0.093U	---
ANTHRACENE	120-12-7	180	---	---	0.097U	---	0.093U	0.094U	---	---	0.094U	---	---	**0.12J**	---
BENZO(A)ANTHRACENE	56-55-3	0.03	---	---	**0.37**	---	**0.052J**	**0.05J**	---	---	**0.096J**	---	---	**0.24**	---
BENZO(A)PYRENE	50-32-8	0.025	0.2	0.2	**1.7**	---	**0.073J**	**0.076J**	---	---	**0.22**	---	---	**0.22**	---
BENZO(B)FLUORANTHENE	205-99-2	0.25	---	---	**3.4**	---	0.093U	0.094U	---	---	**0.38**	---	---	**0.24**	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---	---	**1.4**	---	0.093U	0.094U	---	---	**0.32**	---	---	**0.12J**	---
BENZO(K)FLUORANTHENE	207-08-9	2.5	---	---	**1.3**	---	0.093U	0.094U	---	---	**0.17J**	---	---	**0.14J**	---
CHRYSENE	218-01-9	25	---	---	**1.8**	---	0.19U	0.19U	---	---	**0.24**	---	---	**0.25**	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---	---	**0.41**	---	0.093U	0.094U	---	---	0.094U	---	---	0.093U	---
FLUORANTHENE	206-44-0	80	---	---	**1.5**	---	**0.071J**	**0.083J**	---	---	**0.25**	---	---	**0.53**	---
FLUORENE	86-73-7	29	---	---	0.097U	---	**0.33J**	**0.54J**	---	---	**0.21**	---	---	0.093U	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---	---	**1.7**	---	0.093U	0.094U	---	---	**0.23**	---	---	**0.14J**	---
NAPHTHALENE	91-20-3	0.17	---	20	0.097U	---	**160J**	**150J**	---	---	**250**	---	---	0.093U	---
PHENANTHRENE	85-01-8	---	---	---	**0.34**	---	**0.097J**	**0.12J**	---	---	**0.15J**	---	---	**0.52**	---
PYRENE	129-00-0	12	---	---	**2.2**	---	0.093U	0.094U	---	---	**0.16J**	---	---	**0.29**	---
PCBs (µg/L)															
AROCLOR 1016	12674-11-2	0.14	---	---	0.24UJ	---	0.24UJ	0.24UJ	---	---	0.23UJ	---	---	0.23U	---
AROCLOR 1221	11104-28-2	0.0047	---	---	0.24UJ	---	0.24UJ	0.24UJ	---	---	0.23UJ	---	---	0.23U	---
AROCLOR 1232	11141-16-5	0.0047	---	---	0.24UJ	---	0.24UJ	0.24UJ	---	---	0.23UJ	---	---	0.23U	---
AROCLOR 1242	53469-21-9	0.0078	---	---	0.24UJ	---	0.24UJ	0.24UJ	---	---	0.23UJ	---	---	0.23U	---
AROCLOR 1248	12672-29-6	0.0078	---	---	0.24UJ	---	0.24UJ	0.24UJ	---	---	0.23UJ	---	---	0.23U	---
AROCLOR 1254	11097-69-1	0.0078	---	---	0.24UJ	---	0.24UJ	0.24UJ	---	---	0.23UJ	---	---	0.23U	---
AROCLOR 1260	11096-82-5	0.0078	---	---	0.24UJ	---	0.24UJ	0.24UJ	---	---	0.23UJ	---	---	0.23U	---
TOTAL PCBs		0.044	0.5	**0.5**	1.7UJ	---	1.7UJ	1.7UJ	---	---	1.6UJ	---	---	1.6U	---
METALS TOTAL (µg/L)															
ALUMINUM	7429-90-5	2000			**218**	---	**174**	**148**	---	---	100U	---	---	100U	---
ANTIMONY	7440-36-0	0.78	6	6	1.0U	---	**0.2J**	0.5U	---	---	**0.12J**	---	---	0.50U	---
ARSENIC	7440-38-2	0.052	10	10	**5.8**	---	**11**	**12**	---	---	**8.9**	---	1.0U	4.0U	---
BARIUM	7440-39-3	380	2000	2000	**11.8**	---	**51**	**50.8**	---	---	**77.8**	---	**8.5J**	**9.86**	---
BERYLLIUM	7440-41-7	2.5	4	4	**0.096J**	---	**0.079J**	**0.087J**	---	---	0.2U	---	---	0.2U	---
CADMIUM	7440-43-9	0.92	5	5	**0.16J**	---	**0.27J**	**0.18J**	---	---	0.2U	---	**0.10J**	**0.039J**	---
CALCIUM	7440-70-2				**2870**	---	**40600**	**40300**	---	---	**68600**	---	---	**24600**	---
CHROMIUM	7440-47-3	2200	100	100	5.0U	---	5.0U	5.0U	---	---	5.0U	---	3.0U	5.0U	---
COBALT	7440-48-4	0.6			**0.81J**	---	**1.92**	**1.87**	---	---	1.0U	---	---	**0.11J**	---
COPPER	7440-50-8	80	1300		**5.74**	---	**4.09**	**3.45**	---	---	3.0U	---	---	3.0U	---
IRON	7439-89-6	1400			**3470**	---	**67600**	**68700**	---	---	**57400**	---	---	60U	---
LEAD	7439-92-1	15	15	15	**1.47**	---	**0.63J**	**0.55J**	---	---	1.0U	---	1.0UJ	0.5U	---
MAGNESIUM	7439-95-4				**467**	---	**3440**	**3540**	---	---	**4710**	---	---	**2030**	---
MANGANESE	7439-96-5	43			**61.1**	---	**2330**	**2350**	---	---	**1750**	---	---	**2.3**	---
MERCURY	7439-97-6	0.063	2	2	0.1U	---	**0.013J**	0.1U	---	---	0.1U	---	0.20U	0.1U	---
NICKEL	7440-02-0	39			**1.72J**	---	2.0U	2.0U	---	---	2.0U	---	---	2.0U	---
POTASSIUM	7440-09-7				**321J**	---	**4870**	**4990**	---	---	**8730**	---	---	**2260**	---
SELENIUM	7782-49-2	10	50	50	5.0U	---	3.0U	3.0U	---	---	5.0U	---	2.0U	**0.59J**	---
SILVER	7440-22-4	9.4			0.4U	---	0.4U	0.4U	---	---	0.4U	---	**0.17J**	0.4U	---
SODIUM	7440-23-5				**3490**	---	**73500**	**73300**	---	---	**170000**	---	---	**7200**	---
THALLIUM	7440-28-0	0.02	2	2	0.4U	---	0.4U	0.4U	---	---	0.4U	---	---	0.4U	---
VANADIUM	7440-62-2	8.6			5.0U	---	4.0U	4.0U	---	---	4.0U	---	---	5.0U	---
ZINC	7440-66-6	600			**85.6**	---	**7J**	**8.7J**	---	---	**4.8J**	---	---	8.0U	---

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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	BB-2		BB-3				BB-4		BMW-3		
				SITE LOCATION	KIEFER PARK		BLUE BEACH				BLUE BEACH		KIEFER PARK (LOCATED ON BLUE BEACH FUDS)		
				SAMPLE ID	BB-2-CI19	BB-2-CI19-F	BB-3-CI19	BB-3-CI19-DUP	BB-3-CI19-F	BB-3-CI19-F-DUP	BB-4-CI19	BB-4-CI19-F	BMW-3-A	BMW-3-CI19	BMW-3-CI19-F
				SAMPLE DATE	24-Oct-19	24-Oct-19	30-Oct-19	30-Oct-19	30-Oct-19	30-Oct-19	28-Oct-19	28-Oct-19	23-Jul-14	29-Oct-19	29-Oct-19
				QC IDENTIFIER			DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE					
ANALYTE	**CAS**	**RSL**	**MCL**	**RIDEM GA GW**											
METALS DISSOLVED (µg/L)															
ALUMINUM, DISSOLVED	7429-90-5	2000			---	100U	---	---	100U	100U	---	100U	---	---	100U
ANTIMONY, DISSOLVED	7440-36-0	0.78	6	6	---	1.0U	---	---	0.5U	0.5U	---	0.5U	---	---	0.5U
ARSENIC, DISSOLVED	7440-38-2	0.052	10	10	---	**5.6**	---	---	**11**	**12**	---	**8.0**	---	---	4.0U
BARIUM, DISSOLVED	7440-39-3	380	2000	2000	---	**11.3**	---	---	**51.7**	**53.4**	---	**72.3**	---	---	**12**
BERYLLIUM, DISSOLVED	7440-41-7	2.5	4	4	---	1.0U	---	---	**0.082J**	**0.054J**	---	0.2U	---	---	0.2U
CADMIUM, DISSOLVED	7440-43-9	0.92	5	5	---	**0.057J**	---	---	**0.13J**	**0.071J**	---	0.2U	---	---	0.2U
CALCIUM, DISSOLVED	7440-70-2				---	**3060**	---	---	**42400**	**45200**	---	**65400**	---	---	**25700**
CHROMIUM, DISSOLVED	7440-47-3	2200	100	100	---	5.0U	---	---	5.0U	5.0U	---	5.0U	---	---	5.0U
COBALT, DISSOLVED	7440-48-4	0.6			---	1.0U	---	---	**2.01**	**2.04**	---	**0.46J**	---	---	**0.073J**
COPPER, DISSOLVED	7440-50-8	80	1300		---	**3.18**	---	---	3.0U	**3.12**	---	3.0U	---	---	3.0U
IRON, DISSOLVED	7439-89-6	1400			---	**3390**	---	---	**71400**	**72000**	---	**53700**	---	---	60U
LEAD, DISSOLVED	7439-92-1	15	15	15	---	1.0U	---	---	**0.21J**	**0.25J**	---	**0.13J**	---	---	0.5U
MAGNESIUM, DISSOLVED	7439-95-4				---	**449**	---	---	**3680**	**3740**	---	**4360**	---	---	**2100**
MANGANESE, DISSOLVED	7439-96-5	43			---	**63.5**	---	---	**2400**	**2470**	---	**1630**	---	---	**2.5**
MERCURY, DISSOLVED	7439-97-6	0.063	2	2	---	0.2U	---	---	0.1UJ	**1.05**	---	0.1U	---	---	0.2U
NICKEL, DISSOLVED	7440-02-0	39			---	**1.58J**	---	---	2.0U	2.0U	---	2.0U	---	---	2.0U
POTASSIUM, DISSOLVED	7440-09-7				---	**310J**	---	---	**5120**	**5280**	---	**8080**	---	---	**2320**
SELENIUM, DISSOLVED	7782-49-2	10	50	50	---	3.0U	---	---	3.0U	3.0U	---	**0.28J**	---	---	**0.55J**
SILVER, DISSOLVED	7440-22-4	9.4			---	0.4U	---	---	**0.066J**	0.4U	---	0.4U	---	---	0.4U
SODIUM, DISSOLVED	7440-23-5				---	**4170**	---	---	**73400**	**76100**	---	**158000**	---	---	**7690**
THALLIUM, DISSOLVED	7440-28-0	0.02	2	2	---	0.4U	---	---	0.4U	0.4U	---	0.4U	---	---	0.4U
VANADIUM, DISSOLVED	7440-62-2	8.6			---	5.0U	---	---	4.0U	4.0U	---	4.0U	---	---	4.0U
ZINC, DISSOLVED	7440-66-6	600			---	**51.4**	---	---	**4.1J**	**9.4J**	---	8.0U	---	---	8.0U

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water
and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds RSL or MCL

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				CDW-1		CDW-2		CDW-3		CDW-4				COE-1	
				BLUE BEACH		BLUE BEACH		BLUE BEACH		BLUE BEACH				BLUE BEACH	
				CDW-1-CI19	CDW-1-CI19-F	CDW-2-CI19	CDW-2-CI19-F	CDW-3-CI19	CDW-3-CI19-F	CDW-4-CI19	CDW-4-CI19-DUP	CDW-4-CI19-F	CDW-4-CI19-F-DUP	COE-1-CI19	COE-1-CI19-F
				23-Oct-19	23-Oct-19	24-Oct-19	24-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**												
VOCs (µg/L)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1,1-TRICHLOROETHANE	71-55-6	800	200	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.076	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1,2-TRICHLOROETHANE	79-00-5	0.041	5	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1-DICHLOROETHANE	75-34-3	2.8	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1-DICHLOROETHENE	75-35-4	28	7	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1-DICHLOROPROPENE	563-58-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,2,3-TRICHLOROBENZENE	87-61-6	0.7	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	---	0.5U	---	0.5U	---	**0.26J**	---	**31**	**31**	---	---	0.5U	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	0.2	0.75U	---	0.75U	---	0.75U	---	0.75U	0.75U	---	---	0.75U	---
1,2-DIBROMOETHANE	106-93-4	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	7.1U	---	0.5U	---	0.5U	---	6.9U	0.5U	---	---	7.5U	---
1,2-DICHLOROETHANE	107-06-2	0.17	5	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,2-DICHLOROPROPANE	78-87-5	0.82	5	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	7.1UJ	---	0.5U	---	7.0U	---	6.9U	0.5U	---	---	0.5U	---
1,3-DICHLOROPROPANE	142-28-9	37	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	0.5U	---	0.5U	---	0.5U	---	6.9U	7.1UJ	---	---	0.5U	---
2,2-DICHLOROPROPANE	594-20-7	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
2-BUTANONE (MEK)	78-93-3	560	---	2.5U	---	2.5U	---	2.5U	---	2.5U	2.5U	---	---	**3.8J**	---
2-CHLOROTOLUENE	95-49-8	24	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
2-HEXANONE	591-78-6	3.8	---	2.5U	---	2.5U	---	2.5U	---	2.5U	2.5U	---	---	2.5U	---
4-CHLOROTOLUENE	106-43-4	25	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
4-ISOPROPYLTOLUENE	99-87-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
4-METHYL-2-PENTANONE	108-10-1	---	---	2.5U	---	2.5U	---	2.5U	---	2.5U	2.5U	---	---	2.5U	---
ACETONE	67-64-1	1400	---	2.5U	---	2.5U	---	5.0U	---	5.0U	2.5U	---	---	**6.2**	---
BENZENE	71-43-2	0.46	5	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
BROMOBENZENE	108-86-1	6.2	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
BROMOMETHANE	74-83-9	0.75	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
BROMOCHLOROMETHANE	74-97-5	8.3	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
BROMODICHLOROMETHANE	75-27-4	0.13	80	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
BROMOFORM	75-25-2	3.3	80	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
CARBON DISULFIDE	75-15-0	81	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	**0.34J**	---
CARBON TETRACHLORIDE	56-23-5	0.46	5	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
CHLOROBENZENE	108-90-7	7.8	100	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
CHLOROETHANE	75-00-3	2100	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
CHLOROFORM	67-66-3	0.22	80	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
CHLOROMETHANE	74-87-3	19	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	70	0.5U	---	0.5U	---	**0.51J**	---	0.5U	0.5U	---	---	0.5U	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
DIBROMOCHLOROMETHANE	124-48-1	0.87	80	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
DIBROMOMETHANE	74-95-3	0.83	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
DICHLORODIFLUOROMETHANE	75-71-8	20	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
DIISOPROPYL ETHER	108-20-3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	1.5	700	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
HEXACHLOROBUTADIENE	87-68-3	0.14	---	0.75U	---	0.75U	---	0.75U	---	0.75U	0.75U	---	---	0.75U	---
ISOPROPYLBENZENE	98-82-8	---	---	0.5U	---	0.5U	---	0.5U	---	**4.4**	**4.3**	---	---	0.5U	---
METHYL BROMIDE	74-83-9	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
METHYL TERT-BUTYL ETHER	1634-04-4	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
METHYLENE CHLORIDE	75-09-2	11	5	2.5U	---	2.5U	---	2.5U	---	2.5U	2.5U	---	---	2.5U	---
NAPHTHALENE	91-20-3	0.17	---	0.094U	---	0.097U	---	0.093U	---	**26J**	**17J**	---	---	**0.08J**	---
N-BUTYL BENZENE	104-51-8	---	---	0.5U	---	0.5U	---	0.5U	---	**1.9**	**1.9**	---	---	0.5U	---
N-PROPYL BENZENE	103-65-1	---	---	0.5U	---	0.5U	---	0.5U	---	**4.5**	**4.4**	---	---	0.5U	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
SEC-BUTYL BENZENE	135-98-8	---	---	0.5U	---	0.5U	---	0.5U	---	**3.4**	**3.5**	---	---	0.5U	---
STYRENE	100-42-5	120	100	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---

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Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				CDW-1		CDW-2		CDW-3		CDW-4				COE-1	
				BLUE BEACH		BLUE BEACH		BLUE BEACH		BLUE BEACH				BLUE BEACH	
				CDW-1-CI19	CDW-1-CI19-F	CDW-2-CI19	CDW-2-CI19-F	CDW-3-CI19	CDW-3-CI19-F	CDW-4-CI19	CDW-4-CI19-DUP	CDW-4-CI19-F	CDW-4-CI19-F-DUP	COE-1-CI19	COE-1-CI19-F
				23-Oct-19	23-Oct-19	24-Oct-19	24-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**												
VOCs (µg/L)															
TERT-BUTYLBENZENE	98-06-6	69	---	0.5U	---	0.5U	---	0.5U	---	**1.8**	**1.9**	---	---	0.5U	---
TETRACHLOROETHENE	127-18-4	4.1	5	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
TETRAHYDROFURAN	109-99-9	340	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---	5.0U	---
TOLUENE	108-88-3	110	1000	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
TRANS-1,2-DICHLOROETHENE	156-60-5	36	100	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
TRICHLOROETHYLENE	79-01-6	0.28	5	0.5U	---	**1.6**	---	**1.7**	---	0.5U	0.5U	---	---	0.5U	---
TRICHLOROFLUOROMETHANE	75-69-4	520	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
VINYL CHLORIDE	75-01-4	0.019	2	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
XYLENE O	95-47-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
XYLENE P,M	179601-23-1	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
TOTAL XYLENES	1330-20-7	19	10000	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
SVOC (µg/L)															
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	7.1U	---	0.5U	---	0.5U	---	6.9U	0.5U	---	---	7.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	7.1UJ	---	0.5U	---	7.0U	---	6.9U	0.5U	---	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	0.5U	---	0.5U	---	0.5U	---	6.9U	7.1UJ	---	---	0.5U	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	71	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
2,4,5-TRICHLOROPHENOL	95-95-4	120	---	18U	---	18U	---	---	---	17U	18UJ	---	---	19U	---
2,4,6-TRICHLOROPHENOL	88-06-2	1.2	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
2,4-DICHLOROPHENOL	120-83-2	4.6	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
2,4-DIMETHYLPHENOL	105-67-9	36	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
2,4-DINITROPHENOL	51-28-5	3.9	---	18U	---	18U	---	---	---	17U	18UJ	---	---	19U	---
2,4-DINITROTOLUENE	121-14-2	0.24	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
2,6-DINITROTOLUENE	606-20-2	0.049	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
trans-1,3-Dichloropropene	10061-02-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
2-CHLORONAPHTHALENE	91-58-7	75	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
2-CHLOROPHENOL	95-57-8	9.1	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	93	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
2-NITROANILINE	88-74-4	19	---	18U	---	18U	---	18U	---	17U	18UJ	---	---	19U	---
2-NITROPHENOL	88-75-5	---	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
3,3'-DICHLOROBENZIDINE	91-94-1	0.13	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
3-NITROANILINE	99-09-2	---	---	18U	---	18U	---	18U	---	17U	18UJ	---	---	19U	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	0.15	---	18U	---	18U	---	---	---	17U	18UJ	---	---	19U	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
4-CHLORO-3-METHYLPHENOL	59-50-7	140	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
4-CHLOROANILINE	106-47-8	0.37	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
4-NITROANILINE	100-01-6	3.8	---	18U	---	18U	---	18U	---	17U	18UJ	---	---	19U	---
4-NITROPHENOL	100-02-7	---	---	18UJ	---	18UJ	---	---	---	17UJ	18UJ	---	---	19UJ	---
BENZOIC ACID	65-85-0	7500	---	18UJ	---	18UJ	---	---	---	17UJ	18UJ	---	---	19UJ	---
BENZYL ALCOHOL	100-51-6	200	---	14U	---	14U	---	14U	---	14U	14UJ	---	---	15UJ	---
BENZYL BUTYL PHTHALATE	85-68-7	16	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	5.9	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	0.014	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	5.6	6	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	**2J**	---
CARBAZOLE	86-74-8	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
CRESOLS, M- & P-		---	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
DIBENZOFURAN	132-64-9	0.79	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
DIETHYL PHTHALATE	84-66-2	1500	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
DIMETHYL PHTHALATE	131-11-3	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
DI-N-BUTYL PHTHALATE	84-74-2	90	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
DI-N-OCTYL PHTHALATE	117-84-0	20	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
HEXACHLOROBENZENE	118-74-1	0.0098	1	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
HEXACHLOROETHANE	67-72-1	0.33	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
ISOPHORONE	78-59-1	78	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				CDW-1		CDW-2		CDW-3		CDW-4				COE-1	
				BLUE BEACH		BLUE BEACH		BLUE BEACH		BLUE BEACH				BLUE BEACH	
				CDW-1-CI19	CDW-1-CI19-F	CDW-2-CI19	CDW-2-CI19-F	CDW-3-CI19	CDW-3-CI19-F	CDW-4-CI19	CDW-4-CI19-DUP	CDW-4-CI19-F	CDW-4-CI19-F-DUP	COE-1-CI19	COE-1-CI19-F
				23-Oct-19	23-Oct-19	24-Oct-19	24-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**												
SVOC (µg/L)															
NITROBENZENE	98-95-3	0.14	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
N-NITROSODIMETHYLAMINE	62-75-9	0.00011	---	7.1UJ	---	7.3UJ	---	7.0U	---	6.9U	7.1UJ	---	---	7.5UJ	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	0.011	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
N-NITROSODIPHENYLAMINE	86-30-6	12	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5UJ	---
PENTACHLOROPHENOL	87-86-5	0.041	1	18U	---	18U	---	---	---	17U	18UJ	---	---	19U	---
PHENOL	108-95-2	580	---	7.1UJ	---	7.3UJ	---	---	---	6.9UJ	7.1UJ	---	---	7.5UJ	---
PAHs (µg/L)															
1-METHYLNAPHTHALENE	90-12-0	1.1	---	0.094U	---	0.097U	---	0.093U	---	**20J**	**11J**	---	---	0.1U	---
2-METHYLNAPHTHALENE	91-57-6	3.6	---	0.094U	---	0.097U	---	0.093U	---	**21J**	**11J**	---	---	0.1U	---
ACENAPHTHENE	83-32-9	53	---	0.094U	---	0.097U	---	0.093U	---	**0.26J**	0.094UJ	---	---	0.1U	---
ACENAPHTHYLENE	208-96-8	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	0.1U	---
ANTHRACENE	120-12-7	180	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	0.1U	---
BENZO(A)ANTHRACENE	56-55-3	0.03	---	0.094UJ	---	0.097UJ	---	0.093U	---	0.092U	0.094U	---	---	**0.40**	---
BENZO(A)PYRENE	50-32-8	0.025	0.2	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.11J**	---
BENZO(B)FLUORANTHENE	205-99-2	0.25	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.35**	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.077J**	---
BENZO(K)FLUORANTHENE	207-08-9	2.5	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	0.1U	---
CHRYSENE	218-01-9	25	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.16J**	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.13J**	---
FLUORANTHENE	206-44-0	80	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.15J**	---
FLUORENE	86-73-7	29	---	0.094U	---	0.097U	---	0.093U	---	**0.29**	**0.18J**	---	---	0.1U	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.13J**	---
NAPHTHALENE	91-20-3	0.17	---	0.094U	---	0.097U	---	0.093U	---	**26J**	**17J**	---	---	**0.08J**	---
PHENANTHRENE	85-01-8	---	---	0.094U	---	0.097U	---	0.093U	---	**0.13J**	**0.069J**	---	---	**0.059J**	---
PYRENE	129-00-0	12	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.28**	---
PCBs (µg/L)															
AROCLOR 1016	12674-11-2	0.14	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
AROCLOR 1221	11104-28-2	0.0047	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
AROCLOR 1232	11141-16-5	0.0047	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
AROCLOR 1242	53469-21-9	0.0078	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
AROCLOR 1248	12672-29-6	0.0078	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
AROCLOR 1254	11097-69-1	0.0078	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
AROCLOR 1260	11096-82-5	0.0078	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
TOTAL PCBs		0.044	0.5	1.6UJ	---	1.7U	---	1.7U	---	1.7UJ	1.6U	---	---	2.1U	---
METALS TOTAL (µg/L)															
ALUMINUM	7429-90-5	2000		**489**	---	100U	---	**35600**	---	100U	**1940**	---	---	100U	---
ANTIMONY	7440-36-0	0.78	6	1.0U	---	1.0U	---	1.0U	---	1.0U	**91.2**	---	---	**2.17**	---
ARSENIC	7440-38-2	0.052	10	4.0U	---	4.0U	---	**6.2**	---	4.0U	**92.2**	---	---	**5.4**	---
BARIUM	7440-39-3	380	2000	**16.9**	---	**10.6**	---	**128**	---	**24.8J**	**1880**	---	---	**12.5**	---
BERYLLIUM	7440-41-7	2.5	4	**0.1J**	---	**0.07J**	---	**3.63**	---	**0.035J**	**42.6**	---	---	0.2U	---
CADMIUM	7440-43-9	0.92	5	**0.067J**	---	**0.047J**	---	**0.312J**	---	**0.046J**	**248**	---	---	1.0U	---
CALCIUM	7440-70-2			**9430**	---	**14000**	---	**26200**	---	**13000**	**15500**	---	---	**213000**	---
CHROMIUM	7440-47-3	2200	100	5.0U	---	5.0U	---	**17**	---	5.0U	**174**	---	---	**72.3**	---
COBALT	7440-48-4	0.6		**1.03**	---	**0.638J**	---	**10.6**	---	**0.087J**	**504**	---	---	**29.6**	---
COPPER	7440-50-8	80	1300	3.0U	---	3.0U	---	**17.4**	---	3.0U	**232**	---	---	**164**	---
IRON	7439-89-6	1400		**13000**	---	**134**	---	**37200**	---	**30200**	**30700**	---	---	**1280000**	---
LEAD	7439-92-1	15	15	**3.82**	---	1.0U	---	**20.3**	---	1.0U	**93.1**	---	---	**451**	---
MAGNESIUM	7439-95-4			**3720**	---	**631**	---	**5950**	---	**2610J**	**6490**	---	---	**850000**	---
MANGANESE	7439-96-5	43		**152**	---	**60.2**	---	**502**	---	**909J**	**1310**	---	---	**6320**	---
MERCURY	7439-97-6	0.063	2	0.1U	---	0.1U	---	0.1U	---	0.1U	0.1U	---	---	0.1U	---
NICKEL	7440-02-0	39		**0.7J**	---	**0.3J**	---	**18.3**	---	1.2U	**511**	---	---	**646**	---
POTASSIUM	7440-09-7			**2690**	---	**1330**	---	**7870**	---	**2200**	**11500**	---	---	**243000**	---
SELENIUM	7782-49-2	10	50	5.0U	---	3.0U	---	5.0U	---	3.0U	**96.7**	---	---	**0.2J**	---
SILVER	7440-22-4	9.4		0.4U	---	0.4U	---	**0.13J**	---	0.4U	**53.5**	---	---	1.0U	---
SODIUM	7440-23-5			**29800**	---	**9870**	---	**10400**	---	**25000J**	**30500**	---	---	**7360000**	---
THALLIUM	7440-28-0	0.02	2	0.4U	---	0.4U	---	**0.33J**	---	0.4U	**95.9**	---	---	0.4U	---
VANADIUM	7440-62-2	8.6		5.0U	---	5.0U	---	**29.4**	---	5.0U	**448**	---	---	5.0U	---
ZINC	7440-66-6	600		**5.9J**	---	**63.6**	---	**250**	---	**4.5J**	**463**	---	---	**207000**	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				CDW-1		CDW-2		CDW-3		CDW-4				COE-1	
				BLUE BEACH		BLUE BEACH		BLUE BEACH		BLUE BEACH				BLUE BEACH	
				CDW-1-CI19	CDW-1-CI19-F	CDW-2-CI19	CDW-2-CI19-F	CDW-3-CI19	CDW-3-CI19-F	CDW-4-CI19	CDW-4-CI19-DUP	CDW-4-CI19-F	CDW-4-CI19-F-DUP	COE-1-CI19	COE-1-CI19-F
				23-Oct-19	23-Oct-19	24-Oct-19	24-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**												
METALS DISSOLVED (µg/L)															
ALUMINUM, DISSOLVED	7429-90-5	2000		---	**134**	---	**2330**	---	**1820**	---	---	100U	100U	---	40U
ANTIMONY, DISSOLVED	7440-36-0	0.78	6	---	1.0U	---	**102**	---	1.0U	---	---	1.0U	1.0U	---	**0.056J**
ARSENIC, DISSOLVED	7440-38-2	0.052	10	---	4.0U	---	**107**	---	4.0U	---	---	4.0U	4.0U	---	4.0U
BARIUM, DISSOLVED	7440-39-3	380	2000	---	**15.6**	---	**2060**	---	**13.9**	---	---	**26.1**	**26.3**	---	**14**
BERYLLIUM, DISSOLVED	7440-41-7	2.5	4	---	**0.04J**	---	**53.6**	---	1.0U	---	---	1.0U	0.2U	---	0.2U
CADMIUM, DISSOLVED	7440-43-9	0.92	5	---	0.2U	---	**272**	---	**0.07J**	---	---	0.2U	**0.03J**	---	1.0U
CALCIUM, DISSOLVED	7440-70-2			---	**9520**	---	**17500**	---	**17900**	---	---	**15100**	**14800**	---	**237000**
CHROMIUM, DISSOLVED	7440-47-3	2200	100	---	5.0U	---	**222**	---	5.0U	---	---	5.0U	5.0U	---	5.0U
COBALT, DISSOLVED	7440-48-4	0.6		---	**0.956J**	---	**572**	---	**1.36**	---	---	1.0U	1.0U	---	**22.3**
COPPER, DISSOLVED	7440-50-8	80	1300	---	3.0U	---	**285**	---	3.0U	---	---	3.0U	3.0U	---	**5.96**
IRON, DISSOLVED	7439-89-6	1400		---	**12700**	---	**1200**	---	**1980**	---	---	**34600**	**33900**	---	**1210000**
LEAD, DISSOLVED	7439-92-1	15	15	---	1.0U	---	**107**	---	1.0U	---	---	0.5U	0.5U	---	**56.1**
MAGNESIUM, DISSOLVED	7439-95-4			---	**3740**	---	**6000**	---	**974**	---	---	**2770**	**2740**	---	**888000**
MANGANESE, DISSOLVED	7439-96-5	43		---	**151**	---	**610**	---	**52.1**	---	---	**957**	**945**	---	**6650**
MERCURY, DISSOLVED	7439-97-6	0.063	2	---	0.1U	---	0.1U	---	0.2U	---	---	0.2U	0.2U	---	0.1U
NICKEL, DISSOLVED	7440-02-0	39		---	**0.58J**	---	**569**	---	**1.1J**	---	---	**0.21J**	1.2U	---	**451**
POTASSIUM, DISSOLVED	7440-09-7			---	**2720**	---	**11900**	---	**1350**	---	---	**2330**	**2290**	---	**263000**
SELENIUM, DISSOLVED	7782-49-2	10	50	---	3.0U	---	**103**	---	5.0U	---	---	3.0U	3.0U	---	3.0U
SILVER, DISSOLVED	7440-22-4	9.4		---	0.4U	---	**56.1**	---	0.4U	---	---	0.4U	0.4U	---	0.4U
SODIUM, DISSOLVED	7440-23-5			---	**30400**	---	**17600**	---	**7860**	---	---	**26200**	**25800**	---	**7650000**
THALLIUM, DISSOLVED	7440-28-0	0.02	2	---	0.4U	---	**105**	---	0.4U	---	---	0.4U	0.4U	---	0.4U
VANADIUM, DISSOLVED	7440-62-2	8.6		---	5.0U	---	5.0U	---	5.0U	---	---	5.0U	5.0U	---	4.0U
ZINC, DISSOLVED	7440-66-6	600		---	**6.2J**	---	**62.6J**	---	**54.1**	---	---	8.0U	**4.9J**	---	**130000**

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water
and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds RSL or MCL

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				COE-2		COE-3		COE-5		COE-6		COE-7		MW-4	
				BLUE BEACH		BLUE BEACH		BLUE BEACH		BLUE BEACH		BLUE BEACH		KIEFER PARK	
				COE-2-CI19	COE-2-CI19-F	COE-3-CI19	COE-3-CI19-F	COE-5-CI19	COE-5-CI19-F	COE-6-CI19	COE-6-CI19-F	COE-7-CI19	COE-7-CI19-F	MW-4-CI19	MW-4-CI19-F
				23-Oct-19	23-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	28-Oct-19	28-Oct-19	29-Oct-19	29-Oct-19	23-Oct-19	23-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**												
VOCs (µg/L)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1,1-TRICHLOROETHANE	71-55-6	800	200	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.076	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1,2-TRICHLOROETHANE	79-00-5	0.041	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1-DICHLOROETHANE	75-34-3	2.8	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1-DICHLOROETHENE	75-35-4	28	7	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1-DICHLOROPROPENE	563-58-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,2,3-TRICHLOROBENZENE	87-61-6	0.7	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	7.4U	---	0.5U	---	0.5U	---	6.9U	---	0.5U	---	0.5U	---
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	**0.38J**	---	**210**	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	0.2	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---
1,2-DIBROMOETHANE	106-93-4	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	7.4U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	7.1U	---
1,2-DICHLOROETHANE	107-06-2	0.17	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,2-DICHLOROPROPANE	78-87-5	0.82	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	0.5U	---	0.5U	---	7.2UJ	---	6.9U	---	7.1U	---	0.5U	---
1,3-DICHLOROPROPANE	142-28-9	37	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	7.4U	---	0.5U	---	7.2U	---	6.9U	---	0.5U	---	7.1U	---
2,2-DICHLOROPROPANE	594-20-7	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
2-BUTANONE (MEK)	78-93-3	560	---	2.5U	---	2.5U	---	**2J**	---	2.5U	---	2.5U	---	2.5U	---
2-CHLOROTOLUENE	95-49-8	24	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
2-HEXANONE	591-78-6	3.8	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---
4-CHLOROTOLUENE	106-43-4	25	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
4-ISOPROPYLTOLUENE	99-87-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	**6.6**	---
4-METHYL-2-PENTANONE	108-10-1	---	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---
ACETONE	67-64-1	1400	---	2.5U	---	2.5U	---	**4.8J**	---	2.5U	---	2.5U	---	5.0U	---
BENZENE	71-43-2	0.46	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
BROMOBENZENE	108-86-1	6.2	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
BROMOMETHANE	74-83-9	0.75	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
BROMOCHLOROMETHANE	74-97-5	8.3	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
BROMODICHLOROMETHANE	75-27-4	0.13	80	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
BROMOFORM	75-25-2	3.3	80	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
CARBON DISULFIDE	75-15-0	81	---	**0.83J**	---	**0.37J**	---	**0.67J**	---	0.5U	---	0.5U	---	0.5U	---
CARBON TETRACHLORIDE	56-23-5	0.46	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
CHLOROBENZENE	108-90-7	7.8	100	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
CHLOROETHANE	75-00-3	2100	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
CHLOROFORM	67-66-3	0.22	80	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
CHLOROMETHANE	74-87-3	19	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	70	0.5U	---	**40**	---	0.5U	---	**0.92J**	---	0.5U	---	0.5U	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
DIBROMOCHLOROMETHANE	124-48-1	0.87	80	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
DIBROMOMETHANE	74-95-3	0.83	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
DICHLORODIFLUOROMETHANE	75-71-8	20	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
DIISOPROPYL ETHER	108-20-3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	1.5	700	0.5U	---	0.5U	---	0.5U	---	**20**	---	0.5U	---	**2.3**	---
HEXACHLOROBUTADIENE	87-68-3	0.14	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---
ISOPROPYLBENZENE	98-82-8	---	---	0.5U	---	0.5U	---	0.5U	---	**0.80J**	---	**3.3**	---	**14**	---
METHYL BROMIDE	74-83-9	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
METHYL TERT-BUTYL ETHER	1634-04-4	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
METHYLENE CHLORIDE	75-09-2	11	5	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---
NAPHTHALENE	91-20-3	0.17	---	0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	**57**	---
N-BUTYL BENZENE	104-51-8	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	**2.3**	---
N-PROPYL BENZENE	103-65-1	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	**0.96J**	---	**19**	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	**6.6**	---
SEC-BUTYL BENZENE	135-98-8	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	**0.6J**	---	**5.0**	---
STYRENE	100-42-5	120	100	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				COE-2		COE-3		COE-5		COE-6		COE-7		MW-4	
				BLUE BEACH		BLUE BEACH		BLUE BEACH		BLUE BEACH		BLUE BEACH		KIEFER PARK	
				COE-2-CI19	COE-2-CI19-F	COE-3-CI19	COE-3-CI19-F	COE-5-CI19	COE-5-CI19-F	COE-6-CI19	COE-6-CI19-F	COE-7-CI19	COE-7-CI19-F	MW-4-CI19	MW-4-CI19-F
				23-Oct-19	23-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	28-Oct-19	28-Oct-19	29-Oct-19	29-Oct-19	23-Oct-19	23-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**												
VOCs (µg/L)															
TERT-BUTYLBENZENE	98-06-6	69	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	**0.71J**	---	**4.1**	---
TETRACHLOROETHENE	127-18-4	4.1	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
TETRAHYDROFURAN	109-99-9	340	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TOLUENE	108-88-3	110	1000	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
TRANS-1,2-DICHLOROETHENE	156-60-5	36	100	0.5U	---	**0.42J**	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
TRICHLOROETHYLENE	79-01-6	0.28	5	0.5U	---	**0.64J**	---	0.5U	---	**0.9J**	---	0.5U	---	0.5U	---
TRICHLOROFLUOROMETHANE	75-69-4	520	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
VINYL CHLORIDE	75-01-4	0.019	2	1.0U	---	**0.98J**	---	1.0U	---	**0.32J**	---	1.0U	---	1.0U	---
XYLENE O	95-47-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
XYLENE P,M	179601-23-1	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	**5.2**	---
TOTAL XYLENES	1330-20-7	19	10000	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	**5.2**	---
SVOC (µg/L)															
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	7.4U	---	0.5U	---	0.5U	---	6.9U	---	0.5U	---	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	7.4U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	7.1U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	0.5U	---	0.5U	---	7.2UJ	---	6.9U	---	7.1U	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	7.4U	---	0.5U	---	7.2U	---	6.9U	---	0.5U	---	7.1U	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	71	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2,4,5-TRICHLOROPHENOL	95-95-4	120	---	19U	---	18U	---	18U	---	17U	---	18U	---	18U	---
2,4,6-TRICHLOROPHENOL	88-06-2	1.2	---	7.4U	---	7.2UJ	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2,4-DICHLOROPHENOL	120-83-2	4.6	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2,4-DIMETHYLPHENOL	105-67-9	36	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2,4-DINITROPHENOL	51-28-5	3.9	---	19U	---	18UJ	---	18U	---	17U	---	18U	---	18U	---
2,4-DINITROTOLUENE	121-14-2	0.24	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2,6-DINITROTOLUENE	606-20-2	0.049	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
trans-1,3-Dichloropropene	10061-02-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
2-CHLORONAPHTHALENE	91-58-7	75	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2-CHLOROPHENOL	95-57-8	9.1	---	7.4U	---	7.2UJ	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	93	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2-NITROANILINE	88-74-4	19	---	19U	---	18U	---	18U	---	17U	---	18U	---	18U	---
2-NITROPHENOL	88-75-5	---	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
3,3'-DICHLOROBENZIDINE	91-94-1	0.13	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
3-NITROANILINE	99-09-2	---	---	19U	---	18U	---	18U	---	17U	---	18U	---	18U	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	0.15	---	19U	---	18U	---	18U	---	17U	---	18U	---	18U	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
4-CHLORO-3-METHYLPHENOL	59-50-7	140	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
4-CHLOROANILINE	106-47-8	0.37	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
4-NITROANILINE	100-01-6	3.8	---	19U	---	18U	---	18U	---	17U	---	18U	---	18U	---
4-NITROPHENOL	100-02-7	---	---	19UJ	---	18UJ	---	18UJ	---	17UJ	---	18UJ	---	18UJ	---
BENZOIC ACID	65-85-0	7500	---	19UJ	---	---	---	18UJ	---	17UJ	---	18UJ	---	18UJ	---
BENZYL ALCOHOL	100-51-6	200	---	15UJ	---	14UJ	---	14UJ	---	14U	---	14U	---	14U	---
BENZYL BUTYL PHTHALATE	85-68-7	16	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	5.9	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	0.014	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	5.6	6	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
CARBAZOLE	86-74-8	---	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
CRESOLS, M- & P-		---	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
DIBENZOFURAN	132-64-9	0.79	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
DIETHYL PHTHALATE	84-66-2	1500	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
DIMETHYL PHTHALATE	131-11-3	---	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
DI-N-BUTYL PHTHALATE	84-74-2	90	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
DI-N-OCTYL PHTHALATE	117-84-0	20	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
HEXACHLOROBENZENE	118-74-1	0.0098	1	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
HEXACHLOROETHANE	67-72-1	0.33	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
ISOPHORONE	78-59-1	78	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---

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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				COE-2		COE-3		COE-5		COE-6		COE-7		MW-4	
				BLUE BEACH		BLUE BEACH		BLUE BEACH		BLUE BEACH		BLUE BEACH		KIEFER PARK	
				COE-2-CI19	COE-2-CI19-F	COE-3-CI19	COE-3-CI19-F	COE-5-CI19	COE-5-CI19-F	COE-6-CI19	COE-6-CI19-F	COE-7-CI19	COE-7-CI19-F	MW-4-CI19	MW-4-CI19-F
				23-Oct-19	23-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	28-Oct-19	28-Oct-19	29-Oct-19	29-Oct-19	23-Oct-19	23-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**												
SVOC (µg/L)															
NITROBENZENE	98-95-3	0.14	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
N-NITROSODIMETHYLAMINE	62-75-9	0.00011	---	7.4UJ	---	7.2UJ	---	7.2UJ	---	6.9U	---	7.1U	---	7.1UJ	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	0.011	---	7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
N-NITROSODIPHENYLAMINE	86-30-6	12	---	7.4UJ	---	7.2UJ	---	7.2UJ	---	6.9U	---	7.1U	---	7.1U	---
PENTACHLOROPHENOL	87-86-5	0.041	1	19U	---	18UJ	---	18U	---	17U	---	18U	---	18U	---
PHENOL	108-95-2	580	---	7.4UJ	---	7.2UJ	---	7.2UJ	---	6.9UJ	---	7.1UJ	---	7.1UJ	---
PAHs (µg/L)															
1-METHYLNAPHTHALENE	90-12-0	1.1	---	0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	**52**	---
2-METHYLNAPHTHALENE	91-57-6	3.6	---	0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	**30**	---
ACENAPHTHENE	83-32-9	53	---	0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	**0.19**	---
ACENAPHTHYLENE	208-96-8	---	---	0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	0.094U	---
ANTHRACENE	120-12-7	180	---	0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	0.094U	---
BENZO(A)ANTHRACENE	56-55-3	0.03	---	**0.46**	---	0.096U	---	0.096U	---	0.092U	---	**0.062J**	---	**0.25J**	---
BENZO(A)PYRENE	50-32-8	0.025	0.2	**0.23**	---	0.096UJ	---	0.096U	---	0.092U	---	**0.068J**	---	0.094U	---
BENZO(B)FLUORANTHENE	205-99-2	0.25	---	**0.45**	---	0.096UJ	---	0.096U	---	0.092U	---	0.094U	---	**0.23**	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---	**0.17J**	---	0.096UJ	---	0.096U	---	0.092U	---	0.094U	---	0.094U	---
BENZO(K)FLUORANTHENE	207-08-9	2.5	---	0.099U	---	0.096UJ	---	0.096U	---	0.092U	---	0.094U	---	0.094U	---
CHRYSENE	218-01-9	25	---	**0.26**	---	0.096U	---	0.096U	---	0.18U	---	0.094U	---	0.094U	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---	0.099U	---	0.096UJ	---	0.096U	---	0.092U	---	0.094U	---	0.094U	---
FLUORANTHENE	206-44-0	80	---	**0.4**	---	0.096U	---	0.096U	---	0.092U	---	**0.11J**	---	0.094U	---
FLUORENE	86-73-7	29	---	0.099U	---	0.096U	---	0.096U	---	0.092U	---	**0.09J**	---	**0.37**	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---	**0.26**	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	0.094U	---
NAPHTHALENE	91-20-3	0.17	---	0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	**57**	---
PHENANTHRENE	85-01-8	---	---	**0.21**	---	0.096U	---	0.096U	---	0.092U	---	**0.074J**	---	0.094U	---
PYRENE	129-00-0	12	---	**0.4**	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	**0.074J**	---
PCBs (µg/L)															
AROCLOR 1016	12674-11-2	0.14	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---
AROCLOR 1221	11104-28-2	0.0047	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---
AROCLOR 1232	11141-16-5	0.0047	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---
AROCLOR 1242	53469-21-9	0.0078	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---
AROCLOR 1248	12672-29-6	0.0078	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---
AROCLOR 1254	11097-69-1	0.0078	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---
AROCLOR 1260	11096-82-5	0.0078	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---
TOTAL PCBs		0.044	0.5	1.6UJ	---	1.7UJ	---	1.7UJ	---	1.7UJ	---	1.6UJ	---	1.7UJ	---
METALS TOTAL (µg/L)															
ALUMINUM	7429-90-5	2000		**47.8J**	---	**9300**	---	100U	---	100U	---	100U	---	**288**	---
ANTIMONY	7440-36-0	0.78	6	0.50U	---	1.0U	---	1.0U	---	0.5U	---	**0.602J**	---	1.0U	---
ARSENIC	7440-38-2	0.052	10	4.0U	---	**4.9J**	---	4.0U	---	4.0U	---	4.0U	---	**3.6J**	---
BARIUM	7440-39-3	380	2000	**23.3**	---	**15.7J**	---	**11**	---	**10.5**	---	**10.6**	---	**30**	---
BERYLLIUM	7440-41-7	2.5	4	0.2U	---	1.0U	---	0.2U	---	0.20U	---	0.2U	---	**0.13J**	---
CADMIUM	7440-43-9	0.92	5	**1.2**	---	1.0U	---	1.0U	---	0.20U	---	**0.625J**	---	**0.052J**	---
CALCIUM	7440-70-2			**21300**	---	**9070**	---	**337000**	---	**11900**	---	**6870**	---	**42700**	---
CHROMIUM	7440-47-3	2200	100	5.0U	---	**51.8**	---	**16**	---	5.0U	---	5.0U	---	5.0U	---
COBALT	7440-48-4	0.6		**1.18**	---	**3.88**	---	**17.3**	---	**3.08**	---	**3.11**	---	**0.37J**	---
COPPER	7440-50-8	80	1300	**3.34**	---	**29.6**	---	**7.55**	---	3.0U	---	3.0U	---	**4.66**	---
IRON	7439-89-6	1400		**31000**	---	**113000**	---	**189000**	---	**10400**	---	**26300**	---	**12000**	---
LEAD	7439-92-1	15	15	**11.2**	---	**6.82**	---	**3.97**	---	**3.66**	---	**0.59J**	---	**4.11**	---
MAGNESIUM	7439-95-4			**16900**	---	**5010**	---	**980000**	---	**1240**	---	**1280**	---	**1330**	---
MANGANESE	7439-96-5	43		**496**	---	**1110**	---	**1400**	---	**222**	---	**535**	---	**52.3**	---
MERCURY	7439-97-6	0.063	2	0.1U	---	**0.013J**	---	0.1U	---	0.1U	---	0.1U	---	0.1U	---
NICKEL	7440-02-0	39		2.0U	---	**27**	---	**15.5**	---	2.0U	---	2.0U	---	**0.8J**	---
POTASSIUM	7440-09-7			**16100**	---	**3030**	---	**314000**	---	**3030**	---	**1500**	---	**2420**	---
SELENIUM	7782-49-2	10	50	3.0U	---	**0.36J**	---	**0.23J**	---	3.0U	---	3.0U	---	5.0U	---
SILVER	7440-22-4	9.4		0.4U	---	1.0U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---
SODIUM	7440-23-5			**256000**	---	**22800J**	---	**9300000**	---	**5600**	---	**10400**	---	**3180**	---
THALLIUM	7440-28-0	0.02	2	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---
VANADIUM	7440-62-2	8.6		4.0U	---	**16.4**	---	5.0U	---	4.0U	---	5.0U	---	5.0U	---
ZINC	7440-66-6	600		**6720**	---	**27100**	---	**4100**	---	**353**	---	**158**	---	**5.1J**	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				COE-2		COE-3		COE-5		COE-6		COE-7		MW-4	
				BLUE BEACH		BLUE BEACH		BLUE BEACH		BLUE BEACH		BLUE BEACH		KIEFER PARK	
				COE-2-CI19	COE-2-CI19-F	COE-3-CI19	COE-3-CI19-F	COE-5-CI19	COE-5-CI19-F	COE-6-CI19	COE-6-CI19-F	COE-7-CI19	COE-7-CI19-F	MW-4-CI19	MW-4-CI19-F
				23-Oct-19	23-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	28-Oct-19	28-Oct-19	29-Oct-19	29-Oct-19	23-Oct-19	23-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**												
METALS DISSOLVED (µg/L)															
ALUMINUM, DISSOLVED	7429-90-5	2000		---	**24J**	---	**178**	---	40U	---	**762**	---	100U	---	**115**
ANTIMONY, DISSOLVED	7440-36-0	0.78	6	---	0.5U	---	0.5U	---	0.5U	---	**2.84**	---	0.5U	---	1.0U
ARSENIC, DISSOLVED	7440-38-2	0.052	10	---	4.0U	---	4.0U	---	4.0U	---	4.0U	---	4.0U	---	**3.5J**
BARIUM, DISSOLVED	7440-39-3	380	2000	---	**22.9**	---	**5.74**	---	**10.3**	---	**10.7**	---	**10.8**	---	**31**
BERYLLIUM, DISSOLVED	7440-41-7	2.5	4	---	0.2U	---	0.2U	---	0.2U	---	0.2U	---	0.2U	---	**0.068J**
CADMIUM, DISSOLVED	7440-43-9	0.92	5	---	**0.417J**	---	0.2U	---	0.2U	---	0.2U	---	**0.27J**	---	0.2U
CALCIUM, DISSOLVED	7440-70-2			---	**20700**	---	**9180J**	---	**335000**	---	**11800**	---	**6810**	---	**49700**
CHROMIUM, DISSOLVED	7440-47-3	2200	100	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U
COBALT, DISSOLVED	7440-48-4	0.6		---	**0.979J**	---	**0.47J**	---	**9.2**	---	**2.74**	---	**3.13**	---	**0.26J**
COPPER, DISSOLVED	7440-50-8	80	1300	---	**0.64J**	---	3.0U	---	3.0U	---	3.0U	---	3.0U	---	**3.22**
IRON, DISSOLVED	7439-89-6	1400		---	**19100**	---	**34300J**	---	**77900**	---	**10200**	---	**26400**	---	**13500**
LEAD, DISSOLVED	7439-92-1	15	15	---	**4.35**	---	**0.2J**	---	**0.083J**	---	**6.14**	---	**0.32J**	---	**1.08**
MAGNESIUM, DISSOLVED	7439-95-4			---	**16600**	---	**4080**	---	**980000**	---	**1280**	---	**1260**	---	**1540**
MANGANESE, DISSOLVED	7439-96-5	43		---	**450**	---	**788**	---	**675**	---	**235**	---	**532**	---	**58.6**
MERCURY, DISSOLVED	7439-97-6	0.063	2	---	0.1U	---	0.2UJ	---	0.1U	---	0.1U	---	0.1U	---	0.1U
NICKEL, DISSOLVED	7440-02-0	39		---	2.0U	---	**2.14**	---	**5.54**	---	2.0U	---	2.0U	---	**0.69J**
POTASSIUM, DISSOLVED	7440-09-7			---	**16100**	---	**2320J**	---	**314000**	---	**3190**	---	**1450**	---	**2610**
SELENIUM, DISSOLVED	7782-49-2	10	50	---	3.0U	---	3.0U	---	3.0U	---	3.0U	---	3.0U	---	3.0U
SILVER, DISSOLVED	7440-22-4	9.4		---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U
SODIUM, DISSOLVED	7440-23-5			---	**252000**	---	**22700J**	---	**8300000**	---	**5860**	---	**10400**	---	**3570**
THALLIUM, DISSOLVED	7440-28-0	0.02	2	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U
VANADIUM, DISSOLVED	7440-62-2	8.6		---	4.0U	---	4.0U	---	**0.91J**	---	4.0U	---	4.0U	---	5.0U
ZINC, DISSOLVED	7440-66-6	600		---	**2810**	---	**3010**	---	**98.4**	---	**51.2**	---	**146**	---	8.0U

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water
and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds RSL or MCL

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				MW-8		MW-10		MW-11		MW-12		MW-21		MW-101D		
				KIEFER PARK		KIEFER PARK		KIEFER PARK		KIEFER PARK		KIEFER PARK		BLUE BEACH		
				MW-8-CI19	MW-8-CI19-F	MW-10-CI19	MW-10-CI19-F	MW-11-CI19	MW-11-CI19-F	MW-12-CI19	MW-12-CI19-F	MW-21-CI19	MW-21-CI19-F	MW-101D-A	MW-101D-CI19	MW-101D-CI19-F
				24-Oct-19	24-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19	25-Oct-19	25-Oct-19	28-Oct-19	28-Oct-19	22-Jul-14	23-Oct-19	23-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**													
VOCs (µg/L)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
1,1,1-TRICHLOROETHANE	71-55-6	800	200	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.076	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	---	0.5U	---
1,1,2-TRICHLOROETHANE	79-00-5	0.041	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
1,1-DICHLOROETHANE	75-34-3	2.8	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
1,1-DICHLOROETHENE	75-35-4	28	7	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
1,1-DICHLOROPROPENE	563-58-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
1,2,3-TRICHLOROBENZENE	87-61-6	0.7	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	7.2U	---
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	---	**200**	---	**220**	---	0.5U	---	**140**	---	0.5U	---	0.2U	0.5U	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	0.2	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---	2.0U	0.75U	---
1,2-DIBROMOETHANE	106-93-4	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	0.5U	---	7.0U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	7.2U	---
1,2-DICHLOROETHANE	107-06-2	0.17	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
1,2-DICHLOROPROPANE	78-87-5	0.82	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---	**65**	---	**92**	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	7.1UJ	---	7.0U	---	0.5U	---	7.0U	---	6.9U	---	0.5U	0.5U	---
1,3-DICHLOROPROPANE	142-28-9	37	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	7.1U	---	7.0U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
2,2-DICHLOROPROPANE	594-20-7	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
2-BUTANONE (MEK)	78-93-3	560	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	5.0U	2.5U	---
2-CHLOROTOLUENE	95-49-8	24	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
2-HEXANONE	591-78-6	3.8	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	5.0U	2.5U	---
4-CHLOROTOLUENE	106-43-4	25	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
4-ISOPROPYLTOLUENE	99-87-6	---	---	**10**	---	**10**	---	**0.95J**	---	**3.8**	---	0.5U	---	0.2U	0.5U	---
4-METHYL-2-PENTANONE	108-10-1	---	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	5.0U	2.5U	---
ACETONE	67-64-1	1400	---	**17**	---	**12**	---	2.5U	---	5.3U	---	**6.1**	---	5.0U	2.5U	---
BENZENE	71-43-2	0.46	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
BROMOBENZENE	108-86-1	6.2	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
BROMOMETHANE	74-83-9	0.75	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---
BROMOCHLOROMETHANE	74-97-5	8.3	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
BROMODICHLOROMETHANE	75-27-4	0.13	80	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
BROMOFORM	75-25-2	3.3	80	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
CARBON DISULFIDE	75-15-0	81	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
CARBON TETRACHLORIDE	56-23-5	0.46	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
CHLOROBENZENE	108-90-7	7.8	100	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
CHLOROETHANE	75-00-3	2100	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---
CHLOROFORM	67-66-3	0.22	80	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
CHLOROMETHANE	74-87-3	19	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	0.5U	1.0U	---
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	70	0.5U	---	0.5U	---	**0.23J**	---	0.5U	---	**0.23J**	---	0.5U	0.5U	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
DIBROMOCHLOROMETHANE	124-48-1	0.87	80	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
DIBROMOMETHANE	74-95-3	0.83	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
DICHLORODIFLUOROMETHANE	75-71-8	20	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---
DIISOPROPYL ETHER	108-20-3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	1.5	700	**11**	---	**28**	---	0.5U	---	**4.8**	---	0.5U	---	0.2U	0.5U	---
HEXACHLOROBUTADIENE	87-68-3	0.14	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.5U	0.75U	---
ISOPROPYLBENZENE	98-82-8	---	---	**12**	---	**18**	---	0.5U	---	**17**	---	0.5U	---	0.2U	0.5U	---
METHYL BROMIDE	74-83-9	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---
METHYL TERT-BUTYL ETHER	1634-04-4	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
METHYLENE CHLORIDE	75-09-2	11	5	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	0.5U	2.5U	---
NAPHTHALENE	91-20-3	0.17	---	**35**	---	**190**	---	**0.36**	---	**270**	---	0.092U	---	0.5U	0.096U	---
N-BUTYL BENZENE	104-51-8	---	---	**9.8**	---	**10**	---	**0.31J**	---	**2.8**	---	0.5U	---	0.2U	0.5U	---
N-PROPYL BENZENE	103-65-1	---	---	**16**	---	**22**	---	0.5U	---	**22**	---	0.5U	---	0.5U	0.5U	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	**10**	---	**10**	---	**0.95J**	---	**3.8**	---	0.5U	---	0.2U	0.5U	---
SEC-BUTYL BENZENE	135-98-8	---	---	**5.7**	---	**6.5**	---	**2.2**	---	**6.1**	---	0.5U	---	0.2U	0.5U	---
STYRENE	100-42-5	120	100	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				MW-8		MW-10		MW-11		MW-12		MW-21		MW-101D		
				KIEFER PARK		KIEFER PARK		KIEFER PARK		KIEFER PARK		KIEFER PARK		BLUE BEACH		
				MW-8-CI19	MW-8-CI19-F	MW-10-CI19	MW-10-CI19-F	MW-11-CI19	MW-11-CI19-F	MW-12-CI19	MW-12-CI19-F	MW-21-CI19	MW-21-CI19-F	MW-101D-A	MW-101D-CI19	MW-101D-CI19-F
				24-Oct-19	24-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19	25-Oct-19	25-Oct-19	28-Oct-19	28-Oct-19	22-Jul-14	23-Oct-19	23-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**													
VOCs (µg/L)																
TERT-BUTYLBENZENE	98-06-6	69	---	**3.7**	---	**3.6**	---	**1.0**	---	**3.4**	---	0.5U	---	0.2U	0.5U	---
TETRACHLOROETHENE	127-18-4	4.1	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
TETRAHYDROFURAN	109-99-9	340	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	5.0U	---
TOLUENE	108-88-3	110	1000	0.5U	---	**2.4**	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
TRANS-1,2-DICHLOROETHENE	156-60-5	36	100	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
TRICHLOROETHYLENE	79-01-6	0.28	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---
TRICHLOROFLUOROMETHANE	75-69-4	520	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	0.5U	1.0U	---
VINYL CHLORIDE	75-01-4	0.019	2	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	0.5U	1.0U	---
XYLENE O	95-47-6	---	---	**1.4**	---	**3.2**	---	0.5U	---	0.5U	---	0.5U	---	0.2U	0.5U	---
XYLENE P,M	179601-23-1	---	---	**130**	---	**120**	---	1.0U	---	**10**	---	1.0U	---	0.4U	1.0U	---
TOTAL XYLENES	1330-20-7	19	10000	**131**	---	**123**	---	0.5U	---	**10**	---	0.5U	---	0.2U	0.5U	---
SVOC (µg/L)																
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	---	7.2U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	0.5U	---	7.0U	---	0.5U	---	0.5U	---	0.5U	---	---	7.2U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	7.1UJ	---	7.0U	---	0.5U	---	7.0U	---	6.9U	---	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	7.1U	---	7.0U	---	0.5U	---	0.5U	---	0.5U	---	---	0.5U	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	71	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
2,4,5-TRICHLOROPHENOL	95-95-4	120	---	18U	---	18U	---	21U	---	18U	---	17U	---	---	18U	---
2,4,6-TRICHLOROPHENOL	88-06-2	1.2	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
2,4-DICHLOROPHENOL	120-83-2	4.6	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
2,4-DIMETHYLPHENOL	105-67-9	36	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
2,4-DINITROPHENOL	51-28-5	3.9	---	18U	---	18U	---	21U	---	18U	---	17U	---	---	18U	---
2,4-DINITROTOLUENE	121-14-2	0.24	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
2,6-DINITROTOLUENE	606-20-2	0.049	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
trans-1,3-Dichloropropene	10061-02-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	---	0.5U	---
2-CHLORONAPHTHALENE	91-58-7	75	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
2-CHLOROPHENOL	95-57-8	9.1	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	93	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
2-NITROANILINE	88-74-4	19	---	18U	---	18U	---	21U	---	18U	---	17U	---	---	18U	---
2-NITROPHENOL	88-75-5	---	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
3,3'-DICHLOROBENZIDINE	91-94-1	0.13	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
3-NITROANILINE	99-09-2	---	---	18U	---	18U	---	21U	---	18U	---	17U	---	---	18U	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	0.15	---	18U	---	18U	---	21U	---	18U	---	17U	---	---	18U	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
4-CHLORO-3-METHYLPHENOL	59-50-7	140	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
4-CHLOROANILINE	106-47-8	0.37	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
4-NITROANILINE	100-01-6	3.8	---	18U	---	18U	---	21U	---	18U	---	17U	---	---	18U	---
4-NITROPHENOL	100-02-7	---	---	18UJ	---	18UJ	---	21UJ	---	18UJ	---	17UJ	---	---	18UJ	---
BENZOIC ACID	65-85-0	7500	---	18UJ	---	18UJ	---	21UJ	---	18UJ	---	17UJ	---	---	18UJ	---
BENZYL ALCOHOL	100-51-6	200	---	14U	---	14U	---	17UJ	---	14U	---	14U	---	---	14UJ	---
BENZYL BUTYL PHTHALATE	85-68-7	16	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	5.9	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	0.014	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	5.6	6	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
CARBAZOLE	86-74-8	---	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
CRESOLS, M- & P-		---	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
DIBENZOFURAN	132-64-9	0.79	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
DIETHYL PHTHALATE	84-66-2	1500	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
DIMETHYL PHTHALATE	131-11-3	---	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
DI-N-BUTYL PHTHALATE	84-74-2	90	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
DI-N-OCTYL PHTHALATE	117-84-0	20	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
HEXACHLOROBENZENE	118-74-1	0.0098	1	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
HEXACHLOROETHANE	67-72-1	0.33	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
ISOPHORONE	78-59-1	78	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				MW-8		MW-10		MW-11		MW-12		MW-21		MW-101D		
				KIEFER PARK		KIEFER PARK		KIEFER PARK		KIEFER PARK		KIEFER PARK		BLUE BEACH		
				MW-8-CI19	MW-8-CI19-F	MW-10-CI19	MW-10-CI19-F	MW-11-CI19	MW-11-CI19-F	MW-12-CI19	MW-12-CI19-F	MW-21-CI19	MW-21-CI19-F	MW-101D-A	MW-101D-CI19	MW-101D-CI19-F
				24-Oct-19	24-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19	25-Oct-19	25-Oct-19	28-Oct-19	28-Oct-19	22-Jul-14	23-Oct-19	23-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**													
SVOC (µg/L)																
NITROBENZENE	98-95-3	0.14	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
N-NITROSODIMETHYLAMINE	62-75-9	0.00011	---	7.1UJ	---	7.0U	---	8.3UJ	---	7.0U	---	6.9U	---	---	7.2UJ	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	0.011	---	7.1U	---	7.0U	---	8.3U	---	7.0U	---	6.9U	---	---	7.2U	---
N-NITROSODIPHENYLAMINE	86-30-6	12	---	7.1U	---	7.0U	---	8.3UJ	---	7.0U	---	6.9U	---	---	7.2UJ	---
PENTACHLOROPHENOL	87-86-5	0.041	1	18U	---	18U	---	21U	---	18U	---	17U	---	---	18U	---
PHENOL	108-95-2	580	---	7.1UJ	---	7.0UJ	---	8.3UJ	---	7.0UJ	---	6.9UJ	---	---	7.2UJ	---
PAHs (µg/L)																
1-METHYLNAPHTHALENE	90-12-0	1.1	---	**77**	---	**54**	---	0.11U	---	**83**	---	0.092U	---	---	0.096U	---
2-METHYLNAPHTHALENE	91-57-6	3.6	---	**130J**	---	**86**	---	0.11U	---	**110**	---	0.092U	---	---	0.096U	---
ACENAPHTHENE	83-32-9	53	---	0.095U	---	0.093U	---	**0.28**	---	**0.25**	---	0.092U	---	---	0.096U	---
ACENAPHTHYLENE	208-96-8	---	---	0.095U	---	0.093U	---	0.11U	---	0.093U	---	0.092U	---	---	0.096U	---
ANTHRACENE	120-12-7	180	---	0.095U	---	0.093U	---	0.11U	---	0.093U	---	0.092U	---	---	0.096U	---
BENZO(A)ANTHRACENE	56-55-3	0.03	---	**0.093J**	---	0.093U	---	0.11U	---	0.093U	---	**0.57**	---	---	**0.26**	---
BENZO(A)PYRENE	50-32-8	0.025	0.2	**0.083J**	---	0.093U	---	0.11U	---	0.093U	---	**1.5**	---	---	0.096U	---
BENZO(B)FLUORANTHENE	205-99-2	0.25	---	**0.14J**	---	0.093U	---	0.11U	---	0.093U	---	**2.7**	---	---	**0.24**	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---	0.095U	---	0.093U	---	0.11U	---	0.093U	---	**1.4**	---	---	0.096U	---
BENZO(K)FLUORANTHENE	207-08-9	2.5	---	**0.07J**	---	0.093U	---	0.11U	---	0.093U	---	**0.96**	---	---	0.096U	---
CHRYSENE	218-01-9	25	---	**0.089J**	---	0.093U	---	0.11U	---	0.093U	---	**1.5**	---	---	**0.052J**	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---	0.095U	---	0.093U	---	0.11U	---	0.093U	---	**0.3**	---	---	0.096U	---
FLUORANTHENE	206-44-0	80	---	**0.16J**	---	0.093U	---	0.11U	---	0.093U	---	**2.5**	---	---	**0.077J**	---
FLUORENE	86-73-7	29	---	**0.44J**	---	**0.18J**	---	**0.49**	---	**0.32**	---	0.092U	---	---	0.096U	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---	**0.15J**	---	0.093U	---	0.11U	---	0.093U	---	**1.8**	---	---	0.096U	---
NAPHTHALENE	91-20-3	0.17	---	**35**	---	**190**	---	**0.36**	---	**270**	---	0.092U	---	---	0.096U	---
PHENANTHRENE	85-01-8	---	---	0.095U	---	0.093U	---	**0.09J**	---	**0.24**	---	**0.73**	---	---	0.096U	---
PYRENE	129-00-0	12	---	**0.32J**	---	**0.15J**	---	0.11U	---	**0.15J**	---	**1.4**	---	---	**0.089J**	---
PCBs (µg/L)																
AROCLOR 1016	12674-11-2	0.14	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23U	---	0.23UJ	---	---	0.23U	---
AROCLOR 1221	11104-28-2	0.0047	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23U	---	0.23UJ	---	---	0.23U	---
AROCLOR 1232	11141-16-5	0.0047	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23U	---	0.23UJ	---	---	0.23U	---
AROCLOR 1242	53469-21-9	0.0078	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23U	---	0.23UJ	---	---	0.23U	---
AROCLOR 1248	12672-29-6	0.0078	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23U	---	0.23UJ	---	---	0.23U	---
AROCLOR 1254	11097-69-1	0.0078	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23U	---	0.23UJ	---	---	0.23U	---
AROCLOR 1260	11096-82-5	0.0078	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23U	---	0.23UJ	---	---	0.23U	---
TOTAL PCBs		0.044	0.5	1.6UJ	---	1.6UJ	---	1.6UJ	---	1.6U	---	1.6UJ	---	---	1.6U	---
METALS TOTAL (µg/L)																
ALUMINUM	7429-90-5	2000		100U	---	100U	---	**421**	---	100U	---	**129**	---	---	**68.6J**	---
ANTIMONY	7440-36-0	0.78	6	1.0U	---	1.0U	---	1.0U	---	1.0U	---	**0.064J**	---	---	0.50U	---
ARSENIC	7440-38-2	0.052	10	**5.8**	---	**3.4J**	---	4.0U	---	**5.4**	---	4.0U	---	1.0U	4.0U	---
BARIUM	7440-39-3	380	2000	**14.4**	---	**12.9**	---	**15.3**	---	**28.7**	---	**4.32**	---	3.0U	**1.6J**	---
BERYLLIUM	7440-41-7	2.5	4	**0.085J**	---	**0.075J**	---	1.0U	---	**0.34J**	---	0.2U	---	---	**0.052J**	---
CADMIUM	7440-43-9	0.92	5	**0.039J**	---	0.20U	---	1.0U	---	**0.18J**	---	0.20U	---	0.1U	1.0U	---
CALCIUM	7440-70-2			**2790**	---	**3300**	---	**6410**	---	**16900**	---	**1340**	---	---	**2460**	---
CHROMIUM	7440-47-3	2200	100	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	3.0U	5.0U	---
COBALT	7440-48-4	0.6		**1.08**	---	**0.54J**	---	**6.95**	---	**0.927J**	---	1.0U	---	---	**0.14J**	---
COPPER	7440-50-8	80	1300	3.0U	---	3.0U	---	3.0U	---	**7.38**	---	**6.99**	---	---	3.0U	---
IRON	7439-89-6	1400		**41100**	---	**52100**	---	**27100**	---	**25900**	---	**110**	---	---	100U	---
LEAD	7439-92-1	15	15	1.0U	---	1.0U	---	**0.41J**	---	**1.13**	---	1.0U	---	1.0UJ	**0.24J**	---
MAGNESIUM	7439-95-4			**608**	---	**862**	---	**844**	---	**1270**	---	**212**	---	---	**353**	---
MANGANESE	7439-96-5	43		**432**	---	**264**	---	**604**	---	**454**	---	**4.92**	---	---	**3.4**	---
MERCURY	7439-97-6	0.063	2	0.1U	---	0.1U	---	0.1U	---	0.1U	---	0.1U	---	0.2U	0.1U	---
NICKEL	7440-02-0	39		**0.44J**	---	**0.35J**	---	2.0U	---	**0.51J**	---	2.0U	---	---	2.0U	---
POTASSIUM	7440-09-7			**1170**	---	**1390**	---	**1720**	---	**2500**	---	1000U	---	---	1000U	---
SELENIUM	7782-49-2	10	50	3.0U	---	3.0U	---	3.0U	---	5.0U	---	3.0U	---	2.0UJ	**0.21J**	---
SILVER	7440-22-4	9.4		0.4U	---	0.4U	---	1.0U	---	**0.1J**	---	0.4U	---	0.1U	0.4U	---
SODIUM	7440-23-5			**2960**	---	**3220**	---	**3390**	---	**20000**	---	1000U	---	---	**3810**	---
THALLIUM	7440-28-0	0.02	2	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	---	0.4U	---
VANADIUM	7440-62-2	8.6		5.0U	---	5.0U	---	4.0U	---	5.0U	---	5.0U	---	---	4.0U	---
ZINC	7440-66-6	600		**4.2J**	---	8.0U	---	**32**	---	**7.1J**	---	**22**	---	---	**9.0J**	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				MW-8		MW-10		MW-11		MW-12		MW-21		MW-101D		
				KIEFER PARK		KIEFER PARK		KIEFER PARK		KIEFER PARK		KIEFER PARK		BLUE BEACH		
				MW-8-CI19	MW-8-CI19-F	MW-10-CI19	MW-10-CI19-F	MW-11-CI19	MW-11-CI19-F	MW-12-CI19	MW-12-CI19-F	MW-21-CI19	MW-21-CI19-F	MW-101D-A	MW-101D-CI19	MW-101D-CI19-F
				24-Oct-19	24-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19	25-Oct-19	25-Oct-19	28-Oct-19	28-Oct-19	22-Jul-14	23-Oct-19	23-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**													
METALS DISSOLVED (µg/L)																
ALUMINUM, DISSOLVED	7429-90-5	2000		---	100U	---	100U	---	**62J**	---	100U	---	100U	---	---	**21J**
ANTIMONY, DISSOLVED	7440-36-0	0.78	6	---	1.0U	---	1.0U	---	0.5U	---	1.0U	---	0.5U	---	---	0.5U
ARSENIC, DISSOLVED	7440-38-2	0.052	10	---	**5.7**	---	**3.5J**	---	4.0U	---	**4.5J**	---	4.0U	---	---	4.0U
BARIUM, DISSOLVED	7440-39-3	380	2000	---	**14.5**	---	**13.1**	---	**18.8**	---	**26.5**	---	**3.23**	---	---	**1J**
BERYLLIUM, DISSOLVED	7440-41-7	2.5	4	---	1.0U	---	0.2U	---	0.2U	---	1.0U	---	0.2U	---	---	0.2U
CADMIUM, DISSOLVED	7440-43-9	0.92	5	---	0.2U	---	0.2U	---	1.0U	---	**0.03J**	---	0.2U	---	---	**0.038J**
CALCIUM, DISSOLVED	7440-70-2			---	**3040**	---	**3380**	---	**10200**	---	**16000**	---	**1270**	---	---	**2320**
CHROMIUM, DISSOLVED	7440-47-3	2200	100	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	5.0U
COBALT, DISSOLVED	7440-48-4	0.6		---	**1.04**	---	1.0U	---	**6.34**	---	1.0U	---	**0.074J**	---	---	0.3U
COPPER, DISSOLVED	7440-50-8	80	1300	---	3.0U	---	3.0U	---	3.0U	---	**3.54**	---	**7.39**	---	---	**1.3J**
IRON, DISSOLVED	7439-89-6	1400		---	**42000**	---	**51700**	---	**39400**	---	**25300**	---	100U	---	---	100U
LEAD, DISSOLVED	7439-92-1	15	15	---	1.0U	---	0.5U	---	0.5U	---	1.0U	---	**0.31J**	---	---	**0.093J**
MAGNESIUM, DISSOLVED	7439-95-4			---	**636**	---	**870**	---	**958**	---	**1150**	---	**209**	---	---	**307**
MANGANESE, DISSOLVED	7439-96-5	43		---	**447**	---	**262**	---	**944**	---	**420**	---	**3.96**	---	---	**3.5**
MERCURY, DISSOLVED	7439-97-6	0.063	2	---	0.2U	---	0.2U	---	0.1U	---	0.2U	---	0.1U	---	---	0.1U
NICKEL, DISSOLVED	7440-02-0	39		---	**0.5J**	---	**0.47J**	---	2.0U	---	**0.48J**	---	2.0U	---	---	2.0U
POTASSIUM, DISSOLVED	7440-09-7			---	**1180**	---	**1410**	---	**2100**	---	**2460**	---	1000U	---	---	1000U
SELENIUM, DISSOLVED	7782-49-2	10	50	---	5.0U	---	3.0U	---	3.0U	---	3.0U	---	3.0U	---	---	3.0U
SILVER, DISSOLVED	7440-22-4	9.4		---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	---	0.4U
SODIUM, DISSOLVED	7440-23-5			---	**3110**	---	**3290**	---	**3890**	---	**16900**	---	**1070**	---	---	**3190**
THALLIUM, DISSOLVED	7440-28-0	0.02	2	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	---	0.4U
VANADIUM, DISSOLVED	7440-62-2	8.6		---	5.0U	---	5.0U	---	4.0U	---	5.0U	---	**0.56J**	---	---	4.0U
ZINC, DISSOLVED	7440-66-6	600		---	8.0U	---	8.0U	---	**16**	---	**4.2J**	---	**19**	---	---	**6.2J**

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water
and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds RSL or MCL

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				MW-101S			MW-102			MW-103			MW-104			MW-105
				BLUE BEACH			BLUE BEACH			BLUE BEACH			BLUE BEACH			BLUE BEACH
				MW-101S-A	MW-101S-CI19	MW-101S-CI19-F	MW-102-A	MW-102-CI19	MW-102-CI19-F	MW-103-A	MW-103-CI19	MW-103-CI19-F	MW-104-A	MW-104-CI19	MW-104-CI19-F	MW-105-A
				22-Jul-14	23-Oct-19	23-Oct-19	22-Jul-14	23-Oct-19	23-Oct-19	22-Jul-14	24-Oct-19	24-Oct-19	22-Jul-14	24-Oct-19	24-Oct-19	22-Jul-14
ANALYTE	**CAS**	**RSL**	**MCL**													
VOCs (µg/L)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
1,1,1-TRICHLOROETHANE	71-55-6	800	200	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.076	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	---	0.5U	---	---	0.5U	---	---	0.5U	---	---	0.5U	---	---
1,1,2-TRICHLOROETHANE	79-00-5	0.041	5	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
1,1-DICHLOROETHANE	75-34-3	2.8	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
1,1-DICHLOROETHENE	75-35-4	28	7	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
1,1-DICHLOROPROPENE	563-58-6	---	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
1,2,3-TRICHLOROBENZENE	87-61-6	0.7	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	0.5U	0.5U	---	0.5U	7.2U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	**0.3J**
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	0.2	2.0U	0.75U	---	2.0U	0.75U	---	2.0U	0.75U	---	2.0U	0.75U	---	2.0U
1,2-DIBROMOETHANE	106-93-4	---	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
1,2-DICHLOROBENZENE	95-50-1	30	600	0.2U	7.1U	---	0.2U	7.2U	---	0.2U	7.1UJ	---	0.2U	0.5U	---	0.2U
1,2-DICHLOROETHANE	107-06-2	0.17	5	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
1,2-DICHLOROPROPANE	78-87-5	0.82	5	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	**0.2J**
1,3-DICHLOROBENZENE	541-73-1	---	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	7.1UJ	---	0.5U
1,3-DICHLOROPROPANE	142-28-9	37	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
1,4-DICHLOROBENZENE	106-46-7	0.48	75	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	7.1UJ	---	0.2U	0.5U	---	0.2U
2,2-DICHLOROPROPANE	594-20-7	---	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
2-BUTANONE (MEK)	78-93-3	560	---	5.0U	2.5U	---	5.0U	2.5U	---	5.0U	2.5U	---	5.0U	2.5U	---	5.0U
2-CHLOROTOLUENE	95-49-8	24	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
2-HEXANONE	591-78-6	3.8	---	5.0U	2.5U	---	5.0U	2.5U	---	5.0U	2.5U	---	5.0U	2.5U	---	5.0U
4-CHLOROTOLUENE	106-43-4	25	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
4-ISOPROPYLTOLUENE	99-87-6	---	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	**1.7**
4-METHYL-2-PENTANONE	108-10-1	---	---	5.0U	2.5U	---	5.0U	2.5U	---	5.0U	2.5U	---	5.0U	2.5U	---	5.0U
ACETONE	67-64-1	1400	---	5.0U	2.5U	---	5.0U	5.0U	---	5.0U	5.0U	---	5.0U	2.5U	---	5.0U
BENZENE	71-43-2	0.46	5	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	**0.2J**
BROMOBENZENE	108-86-1	6.2	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
BROMOMETHANE	74-83-9	0.75	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U
BROMOCHLOROMETHANE	74-97-5	8.3	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
BROMODICHLOROMETHANE	75-27-4	0.13	80	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
BROMOFORM	75-25-2	3.3	80	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
CARBON DISULFIDE	75-15-0	81	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
CARBON TETRACHLORIDE	56-23-5	0.46	5	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
CHLOROBENZENE	108-90-7	7.8	100	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
CHLOROETHANE	75-00-3	2100	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U
CHLOROFORM	67-66-3	0.22	80	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
CHLOROMETHANE	74-87-3	19	---	0.5U	1.0U	---	0.5U	1.0U	---	0.5U	1.0U	---	0.5U	1.0U	---	0.5U
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	70	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
DIBROMOCHLOROMETHANE	124-48-1	0.87	80	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
DIBROMOMETHANE	74-95-3	0.83	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
DICHLORODIFLUOROMETHANE	75-71-8	20	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U
DIISOPROPYL ETHER	108-20-3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	1.5	700	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	**0.2J**
HEXACHLOROBUTADIENE	87-68-3	0.14	---	0.5U	0.75U	---	0.5U	0.75U	---	0.5U	0.75U	---	0.5U	0.75U	---	0.5U
ISOPROPYLBENZENE	98-82-8	---	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	**7.9**
METHYL BROMIDE	74-83-9	---	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U
METHYL TERT-BUTYL ETHER	1634-04-4	---	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
METHYLENE CHLORIDE	75-09-2	11	5	0.5U	2.5U	---	0.5U	2.5U	---	0.5U	2.5U	---	0.5U	2.5U	---	0.5U
NAPHTHALENE	91-20-3	0.17	---	0.5U	0.095U	---	0.5U	0.096U	---	0.5U	0.094U	---	0.5U	0.094U	---	**0.8J**
N-BUTYL BENZENE	104-51-8	---	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
N-PROPYL BENZENE	103-65-1	---	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	**0.7J**
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	**1.7**
SEC-BUTYL BENZENE	135-98-8	---	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	**7.3**
STYRENE	100-42-5	120	100	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				MW-101S			MW-102			MW-103			MW-104			MW-105
				BLUE BEACH			BLUE BEACH			BLUE BEACH			BLUE BEACH			BLUE BEACH
				MW-101S-A	MW-101S-CI19	MW-101S-CI19-F	MW-102-A	MW-102-CI19	MW-102-CI19-F	MW-103-A	MW-103-CI19	MW-103-CI19-F	MW-104-A	MW-104-CI19	MW-104-CI19-F	MW-105-A
				22-Jul-14	23-Oct-19	23-Oct-19	22-Jul-14	23-Oct-19	23-Oct-19	22-Jul-14	24-Oct-19	24-Oct-19	22-Jul-14	24-Oct-19	24-Oct-19	22-Jul-14
ANALYTE	**CAS**	**RSL**	**MCL**													
VOCs (µg/L)																
TERT-BUTYLBENZENE	98-06-6	69	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	**3.3**
TETRACHLOROETHENE	127-18-4	4.1	5	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
TETRAHYDROFURAN	109-99-9	340	---	---	5.0U	---	---	5.0U	---	---	5.0U	---	---	5.0U	---	---
TOLUENE	108-88-3	110	1000	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
TRANS-1,2-DICHLOROETHENE	156-60-5	36	100	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
TRICHLOROETHYLENE	79-01-6	0.28	5	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U
TRICHLOROFLUOROMETHANE	75-69-4	520	---	0.5U	1.0U	---	0.5U	1.0U	---	0.5U	1.0U	---	0.5U	1.0U	---	0.5U
VINYL CHLORIDE	75-01-4	0.019	2	0.5U	1.0U	---	0.5U	1.0U	---	0.5U	1.0U	---	0.5U	1.0U	---	0.5U
XYLENE O	95-47-6	---	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
XYLENE P,M	179601-23-1	---	---	0.4U	1.0U	---	0.4U	1.0U	---	0.4U	1.0U	---	0.4U	1.0U	---	0.4U
TOTAL XYLENES	1330-20-7	19	10000	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U
SVOC (µg/L)																
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	---	0.5U	---	---	7.2U	---	---	0.5U	---	---	0.5U	---	---
1,2-DICHLOROBENZENE	95-50-1	30	600	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	0.5U	---	---
1,3-DICHLOROBENZENE	541-73-1	---	---	---	0.5U	---	---	0.5U	---	---	0.5U	---	---	7.1UJ	---	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	---	0.5U	---	---	0.5U	---	---	7.1UJ	---	---	0.5U	---	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	71	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
2,4,5-TRICHLOROPHENOL	95-95-4	120	---	---	18U	---	---	18U	---	---	---	---	---	18UJ	---	---
2,4,6-TRICHLOROPHENOL	88-06-2	1.2	---	---	7.1U	---	---	7.2U	---	---	---	---	---	7.1UJ	---	---
2,4-DICHLOROPHENOL	120-83-2	4.6	---	---	7.1U	---	---	7.2U	---	---	---	---	---	7.1UJ	---	---
2,4-DIMETHYLPHENOL	105-67-9	36	---	---	7.1U	---	---	7.2U	---	---	---	---	---	7.1UJ	---	---
2,4-DINITROPHENOL	51-28-5	3.9	---	---	18U	---	---	18U	---	---	---	---	---	18UJ	---	---
2,4-DINITROTOLUENE	121-14-2	0.24	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
2,6-DINITROTOLUENE	606-20-2	0.049	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
trans-1,3-Dichloropropene	10061-02-6	---	---	---	0.5U	---	---	0.5U	---	---	0.5U	---	---	0.5U	---	---
2-CHLORONAPHTHALENE	91-58-7	75	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
2-CHLOROPHENOL	95-57-8	9.1	---	---	7.1U	---	---	7.2U	---	---	---	---	---	7.1UJ	---	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	93	---	---	7.1U	---	---	7.2U	---	---	---	---	---	7.1UJ	---	---
2-NITROANILINE	88-74-4	19	---	---	18U	---	---	18U	---	---	18UJ	---	---	18UJ	---	---
2-NITROPHENOL	88-75-5	---	---	---	7.1U	---	---	7.2U	---	---	---	---	---	7.1UJ	---	---
3,3'-DICHLOROBENZIDINE	91-94-1	0.13	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
3-NITROANILINE	99-09-2	---	---	---	18U	---	---	18U	---	---	18UJ	---	---	18UJ	---	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	0.15	---	---	18U	---	---	18U	---	---	---	---	---	18UJ	---	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
4-CHLORO-3-METHYLPHENOL	59-50-7	140	---	---	7.1U	---	---	7.2U	---	---	---	---	---	7.1UJ	---	---
4-CHLOROANILINE	106-47-8	0.37	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
4-NITROANILINE	100-01-6	3.8	---	---	18U	---	---	18U	---	---	18UJ	---	---	18UJ	---	---
4-NITROPHENOL	100-02-7	---	---	---	18UJ	---	---	18UJ	---	---	---	---	---	18UJ	---	---
BENZOIC ACID	65-85-0	7500	---	---	18UJ	---	---	18UJ	---	---	---	---	---	18UJ	---	---
BENZYL ALCOHOL	100-51-6	200	---	---	14UJ	---	---	14U	---	---	14UJ	---	---	14UJ	---	---
BENZYL BUTYL PHTHALATE	85-68-7	16	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	5.9	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	0.014	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	5.6	6	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
CARBAZOLE	86-74-8	---	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
CRESOLS, M- & P-		---	---	---	7.1U	---	---	7.2U	---	---	---	---	---	7.1UJ	---	---
DIBENZOFURAN	132-64-9	0.79	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
DIETHYL PHTHALATE	84-66-2	1500	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
DIMETHYL PHTHALATE	131-11-3	---	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
DI-N-BUTYL PHTHALATE	84-74-2	90	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
DI-N-OCTYL PHTHALATE	117-84-0	20	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
HEXACHLOROBENZENE	118-74-1	0.0098	1	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
HEXACHLOROETHANE	67-72-1	0.33	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
ISOPHORONE	78-59-1	78	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				MW-101S			MW-102			MW-103			MW-104			MW-105
				BLUE BEACH			BLUE BEACH			BLUE BEACH			BLUE BEACH			BLUE BEACH
				MW-101S-A	MW-101S-CI19	MW-101S-CI19-F	MW-102-A	MW-102-CI19	MW-102-CI19-F	MW-103-A	MW-103-CI19	MW-103-CI19-F	MW-104-A	MW-104-CI19	MW-104-CI19-F	MW-105-A
				22-Jul-14	23-Oct-19	23-Oct-19	22-Jul-14	23-Oct-19	23-Oct-19	22-Jul-14	24-Oct-19	24-Oct-19	22-Jul-14	24-Oct-19	24-Oct-19	22-Jul-14
ANALYTE	**CAS**	**RSL**	**MCL**													
SVOC (µg/L)																
NITROBENZENE	98-95-3	0.14	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
N-NITROSODIMETHYLAMINE	62-75-9	0.00011	---	---	7.1UJ	---	---	7.2UJ	---	---	7.1UJ	---	---	7.1UJ	---	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	0.011	---	---	7.1U	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
N-NITROSODIPHENYLAMINE	86-30-6	12	---	---	7.1UJ	---	---	7.2U	---	---	7.1UJ	---	---	7.1UJ	---	---
PENTACHLOROPHENOL	87-86-5	0.041	1	---	18U	---	---	18U	---	---	---	---	---	18UJ	---	---
PHENOL	108-95-2	580	---	---	7.1UJ	---	---	7.2UJ	---	---	---	---	---	7.1UJ	---	---
PAHs (µg/L)																
1-METHYLNAPHTHALENE	90-12-0	1.1	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
2-METHYLNAPHTHALENE	91-57-6	3.6	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
ACENAPHTHENE	83-32-9	53	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
ACENAPHTHYLENE	208-96-8	---	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
ANTHRACENE	120-12-7	180	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
BENZO(A)ANTHRACENE	56-55-3	0.03	---	---	0.095U	---	---	0.096UJ	---	---	0.094UJ	---	---	0.094UJ	---	---
BENZO(A)PYRENE	50-32-8	0.025	0.2	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
BENZO(B)FLUORANTHENE	205-99-2	0.25	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
BENZO(K)FLUORANTHENE	207-08-9	2.5	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
CHRYSENE	218-01-9	25	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	**0.051J**	---	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
FLUORANTHENE	206-44-0	80	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	**0.096J**	---	---
FLUORENE	86-73-7	29	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
NAPHTHALENE	91-20-3	0.17	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
PHENANTHRENE	85-01-8	---	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	0.094U	---	---
PYRENE	129-00-0	12	---	---	0.095U	---	---	0.096U	---	---	0.094U	---	---	**0.15J**	---	---
PCBs (µg/L)																
AROCLOR 1016	12674-11-2	0.14	---	---	0.24UJ	---	---	0.23U	---	---	0.23U	---	---	0.23U	---	---
AROCLOR 1221	11104-28-2	0.0047	---	---	0.24UJ	---	---	0.23U	---	---	0.23U	---	---	0.23U	---	---
AROCLOR 1232	11141-16-5	0.0047	---	---	0.24UJ	---	---	0.23U	---	---	0.23U	---	---	0.23U	---	---
AROCLOR 1242	53469-21-9	0.0078	---	---	0.24UJ	---	---	0.23U	---	---	0.23U	---	---	0.23U	---	---
AROCLOR 1248	12672-29-6	0.0078	---	---	0.24UJ	---	---	0.23U	---	---	0.23U	---	---	0.23U	---	---
AROCLOR 1254	11097-69-1	0.0078	---	---	0.24UJ	---	---	0.23U	---	---	0.23U	---	---	0.23U	---	---
AROCLOR 1260	11096-82-5	0.0078	---	---	0.24UJ	---	---	0.23U	---	---	0.23U	---	---	0.23U	---	---
TOTAL PCBs		0.044	0.5	---	1.7UJ	---	---	1.6U	---	---	1.6U	---	---	1.6U	---	---
METALS TOTAL (µg/L)																
ALUMINUM	7429-90-5	2000		---	100U	---	---	100U	---	---	**132**	---	---	100U	---	---
ANTIMONY	7440-36-0	0.78	6	---	0.50U	---	---	1.0U	---	---	1.0U	---	---	**2.22**	---	---
ARSENIC	7440-38-2	0.052	10	1.0U	4.0U	---	1.0U	4.0U	---	1.0U	4.0U	---	1.0U	4.0U	---	**3.1**
BARIUM	7440-39-3	380	2000	3.0U	2.0U	---	**12.2J**	**11.6**	---	**2.9J**	**8.84**	---	**5.5J**	**14.3**	---	**46.3**
BERYLLIUM	7440-41-7	2.5	4	---	0.2U	---	---	**0.044J**	---	---	**0.063J**	---	---	0.2U	---	---
CADMIUM	7440-43-9	0.92	5	0.1U	**0.063J**	---	0.1U	**0.035J**	---	**0.10J**	**0.13J**	---	0.1U	0.2U	---	0.1U
CALCIUM	7440-70-2			---	**2350**	---	---	**7660**	---	---	**3200**	---	---	**37700**	---	---
CHROMIUM	7440-47-3	2200	100	3.0U	5.0U	---	3.0U	5.0U	---	3.0U	5.0U	---	3.0U	5.0U	---	3.0U
COBALT	7440-48-4	0.6		---	**0.068J**	---	---	**0.881J**	---	---	**0.14J**	---	---	**0.12J**	---	---
COPPER	7440-50-8	80	1300	---	3.0U	---	---	3.0U	---	---	3.0U	---	---	**3.62**	---	---
IRON	7439-89-6	1400		---	60U	---	---	**61J**	---	---	**168**	---	---	**80J**	---	---
LEAD	7439-92-1	15	15	1.0UJ	0.5U	---	1.0UJ	1.0U	---	1.0UJ	1.0U	---	1.0U	1.0U	---	1.0UJ
MAGNESIUM	7439-95-4			---	**274**	---	---	**1340**	---	---	**540**	---	---	**685**	---	---
MANGANESE	7439-96-5	43		---	**1.5J**	---	---	**1.4J**	---	---	**5.95**	---	---	**4.44**	---	---
MERCURY	7439-97-6	0.063	2	0.2U	0.1U	---	0.2U	0.1U	---	0.2U	0.1U	---	0.2U	0.1U	---	0.2U
NICKEL	7440-02-0	39		---	1.2U	---	---	1.2U	---	---	**0.24J**	---	---	**0.24J**	---	---
POTASSIUM	7440-09-7			---	1000U	---	---	**3590**	---	---	**670J**	---	---	**3020**	---	---
SELENIUM	7782-49-2	10	50	2.0UJ	3.0U	---	2.0UJ	3.0U	---	2.0UJ	3.0U	---	2.0UJ	5.0U	---	2.0UJ
SILVER	7440-22-4	9.4		0.1U	0.4U	---	0.1U	0.4U	---	0.1U	0.4U	---	0.1U	0.4U	---	0.1U
SODIUM	7440-23-5			---	**2630**	---	---	**15000**	---	---	**2960**	---	---	**56300**	---	---
THALLIUM	7440-28-0	0.02	2	---	0.4U	---	---	0.4U	---	---	0.4U	---	---	0.4U	---	---
VANADIUM	7440-62-2	8.6		---	4.0U	---	---	5.0U	---	---	5.0U	---	---	5.0U	---	---
ZINC	7440-66-6	600		---	8.0U	---	---	8.0U	---	---	**102**	---	---	**4.0J**	---	---

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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				MW-101S			MW-102			MW-103			MW-104			MW-105
				BLUE BEACH			BLUE BEACH			BLUE BEACH			BLUE BEACH			BLUE BEACH
				MW-101S-A	MW-101S-CI19	MW-101S-CI19-F	MW-102-A	MW-102-CI19	MW-102-CI19-F	MW-103-A	MW-103-CI19	MW-103-CI19-F	MW-104-A	MW-104-CI19	MW-104-CI19-F	MW-105-A
				22-Jul-14	23-Oct-19	23-Oct-19	22-Jul-14	23-Oct-19	23-Oct-19	22-Jul-14	24-Oct-19	24-Oct-19	22-Jul-14	24-Oct-19	24-Oct-19	22-Jul-14
ANALYTE	**CAS**	**RSL**	**MCL**													
METALS DISSOLVED (µg/L)																
ALUMINUM, DISSOLVED	7429-90-5	2000		---	---	**29J**	---	---	100U	---	---	100U	---	---	100U	---
ANTIMONY, DISSOLVED	7440-36-0	0.78	6	---	---	0.5U	---	---	1.0U	---	---	1.0U	---	---	**2.41**	---
ARSENIC, DISSOLVED	7440-38-2	0.052	10	---	---	4.0U	---	---	4.0U	---	---	4.0U	---	---	4.0U	---
BARIUM, DISSOLVED	7440-39-3	380	2000	---	---	**2.2**	---	---	**12.9**	---	---	**8.28**	---	---	**15.3**	---
BERYLLIUM, DISSOLVED	7440-41-7	2.5	4	---	---	0.2U	---	---	0.2U	---	---	1.0U	---	---	0.2U	---
CADMIUM, DISSOLVED	7440-43-9	0.92	5	---	---	**0.042J**	---	---	**0.088J**	---	---	**0.12J**	---	---	**0.055J**	---
CALCIUM, DISSOLVED	7440-70-2			---	---	**2440**	---	---	**8510**	---	---	**3270**	---	---	**38300**	---
CHROMIUM, DISSOLVED	7440-47-3	2200	100	---	---	5.0U	---	---	5.0U	---	---	5.0U	---	---	5.0U	---
COBALT, DISSOLVED	7440-48-4	0.6		---	---	**0.072J**	---	---	**0.902J**	---	---	1.0U	---	---	1.0U	---
COPPER, DISSOLVED	7440-50-8	80	1300	---	---	**0.24J**	---	---	**3.39**	---	---	3.0U	---	---	**3.59**	---
IRON, DISSOLVED	7439-89-6	1400		---	---	100U	---	---	**86J**	---	---	**34J**	---	---	**44J**	---
LEAD, DISSOLVED	7439-92-1	15	15	---	---	**0.091J**	---	---	1.0U	---	---	0.5U	---	---	1.0U	---
MAGNESIUM, DISSOLVED	7439-95-4			---	---	**286**	---	---	**1360**	---	---	**508**	---	---	**701**	---
MANGANESE, DISSOLVED	7439-96-5	43		---	---	**2.4**	---	---	**1.8J**	---	---	**3.53**	---	---	**4.38**	---
MERCURY, DISSOLVED	7439-97-6	0.063	2	---	---	0.1U	---	---	0.1U	---	---	0.1U	---	---	**1.11**	---
NICKEL, DISSOLVED	7440-02-0	39		---	---	2.0U	---	---	**0.76J**	---	---	**0.34J**	---	---	**0.61J**	---
POTASSIUM, DISSOLVED	7440-09-7			---	---	1000U	---	---	**3690**	---	---	**645J**	---	---	**2970**	---
SELENIUM, DISSOLVED	7782-49-2	10	50	---	---	3.0U	---	---	3.0U	---	---	3.0U	---	---	5.0U	---
SILVER, DISSOLVED	7440-22-4	9.4		---	---	0.4U	---	---	0.4U	---	---	0.4U	---	---	0.4U	---
SODIUM, DISSOLVED	7440-23-5			---	---	**2470**	---	---	**15300**	---	---	**2820**	---	---	**56100**	---
THALLIUM, DISSOLVED	7440-28-0	0.02	2	---	---	0.4U	---	---	0.4U	---	---	0.4U	---	---	0.4U	---
VANADIUM, DISSOLVED	7440-62-2	8.6		---	---	4.0U	---	---	5.0U	---	---	5.0U	---	---	5.0U	---
ZINC, DISSOLVED	7440-66-6	600		---	---	8.0U	---	---	**4.2J**	---	---	**100**	---	---	8.0U	---

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water
and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds RSL or MCL

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				MW-106D	MW-106S	MW-106S	MW-106S	MW-107	MW-107	MW-107	MW-108D	MW-108D	MW-108D	MW-108S	MW-108S	MW-108S
				BLUE BEACH	BLUE BEACH	BLUE BEACH	BLUE BEACH	BLUE BEACH	BLUE BEACH	BLUE BEACH	BLUE BEACH	BLUE BEACH	BLUE BEACH	BLUE BEACH	BLUE BEACH	BLUE BEACH
				MW-106D-CI19	MW-106D-CI19-F	MW-106S-CI19	MW-106S-CI19-F	MW-107-A	MW-107-CI19	MW-107-CI19-F	MW-108D-A	MW-108D-CI19	MW-108D-CI19-F	MW-108S-A	MW-108S-CI19	MW-108S-CI19-F
				23-Oct-19	23-Oct-19	22-Oct-19	22-Oct-19	22-Jul-14	24-Oct-19	24-Oct-19	23-Jul-14	24-Oct-19	24-Oct-19	23-Jul-14	24-Oct-19	24-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**													
VOCs (µg/L)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
1,1,1-TRICHLOROETHANE	71-55-6	800	200	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.076	---	0.5U	---	0.5U	---	**0.2J**	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	0.5U	---	0.5U	---	---	0.5U	---	---	0.5U	---	---	0.5U	---
1,1,2-TRICHLOROETHANE	79-00-5	0.041	5	0.5U	---	0.5U	---	**0.4J**	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
1,1-DICHLOROETHANE	75-34-3	2.8	---	0.5U	---	**0.33J**	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
1,1-DICHLOROETHENE	75-35-4	28	7	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
1,1-DICHLOROPROPENE	563-58-6	---	---	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
1,2,3-TRICHLOROBENZENE	87-61-6	0.7	---	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	0.5U	---	7.1U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	7.0UJ	---
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	---	0.5U	---	0.5U	---	**0.3J**	0.5U	---	0.2U	**0.26J**	---	0.2U	0.5U	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	0.2	0.75U	---	0.75U	---	2.0U	0.75U	---	2.0U	0.75U	---	2.0U	0.75U	---
1,2-DIBROMOETHANE	106-93-4	---	---	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	7.0UJ	---
1,2-DICHLOROETHANE	107-06-2	0.17	5	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
1,2-DICHLOROPROPANE	78-87-5	0.82	5	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---	0.5U	---	0.5U	---	**0.8J**	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	7.1UJ	---	7.1UJ	---	0.5U	7.1UJ	---	0.5U	0.5U	---	0.5U	0.5U	---
1,3-DICHLOROPROPANE	142-28-9	37	---	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	7.1U	---	0.5U	---	0.2U	7.1U	---	0.2U	0.5U	---	0.2U	0.5U	---
2,2-DICHLOROPROPANE	594-20-7	---	---	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
2-BUTANONE (MEK)	78-93-3	560	---	2.5U	---	2.5U	---	5.0U	2.5U	---	5.0U	2.5U	---	5.0U	2.5U	---
2-CHLOROTOLUENE	95-49-8	24	---	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
2-HEXANONE	591-78-6	3.8	---	2.5U	---	2.5U	---	5.0U	2.5U	---	5.0U	2.5U	---	5.0U	2.5U	---
4-CHLOROTOLUENE	106-43-4	25	---	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
4-ISOPROPYLTOLUENE	99-87-6	---	---	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
4-METHYL-2-PENTANONE	108-10-1	---	---	2.5U	---	2.5U	---	5.0U	2.5U	---	5.0U	2.5U	---	5.0U	2.5U	---
ACETONE	67-64-1	1400	---	2.5U	---	2.5U	---	5.0U	5.0U	---	5.0U	2.5U	---	5.0U	5.0U	---
BENZENE	71-43-2	0.46	5	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
BROMOBENZENE	108-86-1	6.2	---	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
BROMOMETHANE	74-83-9	0.75	---	1.0U	---	1.0U	---	1.0U	1.0U	---	1.0UJ	1.0U	---	1.0UJ	1.0U	---
BROMOCHLOROMETHANE	74-97-5	8.3	---	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
BROMODICHLOROMETHANE	75-27-4	0.13	80	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
BROMOFORM	75-25-2	3.3	80	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
CARBON DISULFIDE	75-15-0	81	---	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
CARBON TETRACHLORIDE	56-23-5	0.46	5	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
CHLOROBENZENE	108-90-7	7.8	100	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
CHLOROETHANE	75-00-3	2100	---	1.0U	---	1.0U	---	1.0U	1.0U	---	1.0UJ	1.0U	---	1.0UJ	1.0U	---
CHLOROFORM	67-66-3	0.22	80	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
CHLOROMETHANE	74-87-3	19	---	1.0U	---	1.0U	---	0.5U	1.0U	---	0.5U	1.0U	---	0.5U	1.0U	---
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	70	**5.4**	---	**40**	---	**0.2J**	**0.77J**	---	0.5UJ	0.5U	---	0.5UJ	0.5U	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
DIBROMOCHLOROMETHANE	124-48-1	0.87	80	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
DIBROMOMETHANE	74-95-3	0.83	---	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
DICHLORODIFLUOROMETHANE	75-71-8	20	---	1.0U	---	1.0U	---	1.0U	1.0U	---	1.0U	1.0U	---	1.0U	1.0U	---
DIISOPROPYL ETHER	108-20-3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	1.5	700	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
HEXACHLOROBUTADIENE	87-68-3	0.14	---	0.75U	---	0.75U	---	0.5U	0.75U	---	0.5U	0.75U	---	0.5U	0.75U	---
ISOPROPYLBENZENE	98-82-8	---	---	0.5U	---	0.5U	---	**0.4J**	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
METHYL BROMIDE	74-83-9	---	---	1.0U	---	1.0U	---	1.0U	1.0U	---	1.0UJ	1.0U	---	1.0UJ	1.0U	---
METHYL TERT-BUTYL ETHER	1634-04-4	---	---	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
METHYLENE CHLORIDE	75-09-2	11	5	2.5U	---	2.5U	---	0.5U	2.5U	---	0.5U	2.5U	---	0.5U	2.5U	---
NAPHTHALENE	91-20-3	0.17	---	0.094UJ	---	0.094U	---	**0.3J**	**0.092J**	---	0.5U	0.098U	---	0.5U	0.093UJ	---
N-BUTYL BENZENE	104-51-8	---	---	0.5U	---	0.5U	---	**0.3J**	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
N-PROPYL BENZENE	103-65-1	---	---	0.5U	---	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
SEC-BUTYL BENZENE	135-98-8	---	---	0.5U	---	0.5U	---	**0.6J**	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
STYRENE	100-42-5	120	100	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				MW-106D		MW-106S		MW-107			MW-108D			MW-108S		
				BLUE BEACH		BLUE BEACH		BLUE BEACH			BLUE BEACH			BLUE BEACH		
				MW-106D-CI19	MW-106D-CI19-F	MW-106S-CI19	MW-106S-CI19-F	MW-107-A	MW-107-CI19	MW-107-CI19-F	MW-108D-A	MW-108D-CI19	MW-108D-CI19-F	MW-108S-A	MW-108S-CI19	MW-108S-CI19-F
				23-Oct-19	23-Oct-19	22-Oct-19	22-Oct-19	22-Jul-14	24-Oct-19	24-Oct-19	23-Jul-14	24-Oct-19	24-Oct-19	23-Jul-14	24-Oct-19	24-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**													
VOCs (µg/L)																
TERT-BUTYLBENZENE	98-06-6	69	---	0.5U	---	0.5U	---	**0.5J**	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
TETRACHLOROETHENE	127-18-4	4.1	5	0.5U	---	0.5U	---	**5.8**	0.5U	---	0.5U	0.5U	---	**1.7**	**1.5**	---
TETRAHYDROFURAN	109-99-9	340	---	5.0U	---	5.0U	---	---	5.0U	---	---	5.0U	---	---	5.0U	---
TOLUENE	108-88-3	110	1000	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
TRANS-1,2-DICHLOROETHENE	156-60-5	36	100	0.5U	---	**0.4J**	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
TRICHLOROETHYLENE	79-01-6	0.28	5	**4.9**	---	**14**	---	**0.4J**	0.5U	---	0.5UJ	0.5U	---	**1.6J**	**1.4**	---
TRICHLOROFLUOROMETHANE	75-69-4	520	---	1.0U	---	1.0U	---	0.5U	1.0U	---	0.5U	1.0U	---	0.5U	1.0U	---
VINYL CHLORIDE	75-01-4	0.019	2	1.0U	---	**7.0**	---	0.5U	1.0U	---	0.5U	1.0U	---	0.5U	1.0U	---
XYLENE O	95-47-6	---	---	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
XYLENE P,M	179601-23-1	---	---	1.0U	---	1.0U	---	0.4U	1.0U	---	0.4U	1.0U	---	0.4U	1.0U	---
TOTAL XYLENES	1330-20-7	19	10000	0.5U	---	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---	0.2U	0.5U	---
SVOC (µg/L)																
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	0.5U	---	7.1U	---	---	0.5U	---	---	0.5U	---	---	7.0UJ	---
1,2-DICHLOROBENZENE	95-50-1	30	600	0.5U	---	0.5U	---	---	0.5U	---	---	0.5U	---	---	7.0UJ	---
1,3-DICHLOROBENZENE	541-73-1	---	---	7.1UJ	---	7.1UJ	---	---	7.1UJ	---	---	0.5U	---	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	7.1U	---	0.5U	---	---	7.1U	---	---	0.5U	---	---	0.5U	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	71	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
2,4,5-TRICHLOROPHENOL	95-95-4	120	---	18U	---	18U	---	---	18U	---	---	18U	---	---	18UJ	---
2,4,6-TRICHLOROPHENOL	88-06-2	1.2	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4U	---	---	7.0UJ	---
2,4-DICHLOROPHENOL	120-83-2	4.6	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4U	---	---	7.0UJ	---
2,4-DIMETHYLPHENOL	105-67-9	36	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4U	---	---	7.0UJ	---
2,4-DINITROPHENOL	51-28-5	3.9	---	18U	---	18U	---	---	18U	---	---	18U	---	---	18UJ	---
2,4-DINITROTOLUENE	121-14-2	0.24	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
2,6-DINITROTOLUENE	606-20-2	0.049	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
trans-1,3-Dichloropropene	10061-02-6	---	---	0.5U	---	0.5U	---	---	0.5U	---	---	0.5U	---	---	0.5U	---
2-CHLORONAPHTHALENE	91-58-7	75	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
2-CHLOROPHENOL	95-57-8	9.1	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4U	---	---	7.0UJ	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	93	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4U	---	---	7.0UJ	---
2-NITROANILINE	88-74-4	19	---	18U	---	18U	---	---	18U	---	---	18UJ	---	---	18UJ	---
2-NITROPHENOL	88-75-5	---	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4U	---	---	7.0UJ	---
3,3'-DICHLOROBENZIDINE	91-94-1	0.13	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
3-NITROANILINE	99-09-2	---	---	18U	---	18U	---	---	18U	---	---	18UJ	---	---	18UJ	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	0.15	---	18U	---	18U	---	---	18U	---	---	18U	---	---	18UJ	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
4-CHLORO-3-METHYLPHENOL	59-50-7	140	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4U	---	---	7.0UJ	---
4-CHLOROANILINE	106-47-8	0.37	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
4-NITROANILINE	100-01-6	3.8	---	18U	---	18U	---	---	18U	---	---	18UJ	---	---	18UJ	---
4-NITROPHENOL	100-02-7	---	---	18UJ	---	18UJ	---	---	18UJ	---	---	18UJ	---	---	18UJ	---
BENZOIC ACID	65-85-0	7500	---	18UJ	---	18UJ	---	---	18UJ	---	---	18UJ	---	---	18UJ	---
BENZYL ALCOHOL	100-51-6	200	---	14UJ	---	14UJ	---	---	14U	---	---	15UJ	---	---	14UJ	---
BENZYL BUTYL PHTHALATE	85-68-7	16	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	5.9	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	0.014	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	5.6	6	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
CARBAZOLE	86-74-8	---	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
CRESOLS, M- & P-		---	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4U	---	---	7.0UJ	---
DIBENZOFURAN	132-64-9	0.79	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
DIETHYL PHTHALATE	84-66-2	1500	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
DIMETHYL PHTHALATE	131-11-3	---	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
DI-N-BUTYL PHTHALATE	84-74-2	90	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
DI-N-OCTYL PHTHALATE	117-84-0	20	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
HEXACHLOROBENZENE	118-74-1	0.0098	1	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
HEXACHLOROETHANE	67-72-1	0.33	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
ISOPHORONE	78-59-1	78	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				MW-106D		MW-106S		MW-107			MW-108D			MW-108S		
				BLUE BEACH		BLUE BEACH		BLUE BEACH			BLUE BEACH			BLUE BEACH		
				MW-106D-CI19	MW-106D-CI19-F	MW-106S-CI19	MW-106S-CI19-F	MW-107-A	MW-107-CI19	MW-107-CI19-F	MW-108D-A	MW-108D-CI19	MW-108D-CI19-F	MW-108S-A	MW-108S-CI19	MW-108S-CI19-F
				23-Oct-19	23-Oct-19	22-Oct-19	22-Oct-19	22-Jul-14	24-Oct-19	24-Oct-19	23-Jul-14	24-Oct-19	24-Oct-19	23-Jul-14	24-Oct-19	24-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**													
SVOC (µg/L)																
NITROBENZENE	98-95-3	0.14	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
N-NITROSODIMETHYLAMINE	62-75-9	0.00011	---	7.1UJ	---	7.1UJ	---	---	7.1UJ	---	---	7.4UJ	---	---	7.0UJ	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	0.011	---	7.1U	---	7.1U	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
N-NITROSODIPHENYLAMINE	86-30-6	12	---	7.1UJ	---	7.1UJ	---	---	7.1U	---	---	7.4UJ	---	---	7.0UJ	---
PENTACHLOROPHENOL	87-86-5	0.041	1	18U	---	18U	---	---	18U	---	---	18U	---	---	18UJ	---
PHENOL	108-95-2	580	---	7.1UJ	---	7.1UJ	---	---	7.1UJ	---	---	7.4UJ	---	---	7.0UJ	---
PAHs (µg/L)																
1-METHYLNAPHTHALENE	90-12-0	1.1	---	0.094UJ	---	0.094U	---	---	**0.38**	---	---	0.098U	---	---	0.093UJ	---
2-METHYLNAPHTHALENE	91-57-6	3.6	---	0.094UJ	---	0.094U	---	---	0.094U	---	---	0.098U	---	---	0.093UJ	---
ACENAPHTHENE	83-32-9	53	---	0.094UJ	---	0.094U	---	---	0.094U	---	---	0.098U	---	---	0.093UJ	---
ACENAPHTHYLENE	208-96-8	---	---	0.094UJ	---	0.094U	---	---	0.094U	---	---	0.098U	---	---	0.093UJ	---
ANTHRACENE	120-12-7	180	---	0.094UJ	---	0.094U	---	---	0.094U	---	---	0.098U	---	---	0.093UJ	---
BENZO(A)ANTHRACENE	56-55-3	0.03	---	0.094UJ	---	0.094U	---	---	0.094UJ	---	---	0.098UJ	---	---	0.093UJ	---
BENZO(A)PYRENE	50-32-8	0.025	0.2	0.094UJ	---	0.094U	---	---	0.094U	---	---	0.098U	---	---	0.093UJ	---
BENZO(B)FLUORANTHENE	205-99-2	0.25	---	0.094UJ	---	0.094U	---	---	0.094U	---	---	0.098U	---	---	0.093UJ	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---	0.094UJ	---	0.094U	---	---	0.094U	---	---	0.098U	---	---	0.093UJ	---
BENZO(K)FLUORANTHENE	207-08-9	2.5	---	0.094UJ	---	0.094U	---	---	0.094U	---	---	0.098U	---	---	0.093UJ	---
CHRYSENE	218-01-9	25	---	0.094UJ	---	0.094U	---	---	**0.064J**	---	---	0.098U	---	---	0.093UJ	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---	0.094UJ	---	0.094U	---	---	0.094U	---	---	0.098U	---	---	0.093UJ	---
FLUORANTHENE	206-44-0	80	---	0.094UJ	---	0.094U	---	---	**0.11J**	---	---	0.098U	---	---	0.093UJ	---
FLUORENE	86-73-7	29	---	0.094UJ	---	0.094U	---	---	**0.061J**	---	---	0.098U	---	---	0.093UJ	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---	0.094UJ	---	0.094U	---	---	**0.15J**	---	---	0.098U	---	---	0.093UJ	---
NAPHTHALENE	91-20-3	0.17	---	0.094UJ	---	0.094U	---	---	**0.092J**	---	---	0.098U	---	---	0.093UJ	---
PHENANTHRENE	85-01-8	---	---	0.094UJ	---	0.094U	---	---	0.094U	---	---	0.098U	---	---	0.093UJ	---
PYRENE	129-00-0	12	---	**0.084J**	---	0.094U	---	---	**0.16J**	---	---	0.098U	---	---	0.093UJ	---
PCBs (µg/L)																
AROCLOR 1016	12674-11-2	0.14	---	0.23UJ	---	0.24UJ	---	---	0.24UJ	---	---	0.24UJ	---	---	0.24U	---
AROCLOR 1221	11104-28-2	0.0047	---	0.23UJ	---	0.24UJ	---	---	0.24UJ	---	---	0.24UJ	---	---	0.24U	---
AROCLOR 1232	11141-16-5	0.0047	---	0.23UJ	---	0.24UJ	---	---	0.24UJ	---	---	0.24UJ	---	---	0.24U	---
AROCLOR 1242	53469-21-9	0.0078	---	0.23UJ	---	0.24UJ	---	---	0.24UJ	---	---	0.24UJ	---	---	0.24U	---
AROCLOR 1248	12672-29-6	0.0078	---	0.23UJ	---	0.24UJ	---	---	0.24UJ	---	---	0.24UJ	---	---	0.24U	---
AROCLOR 1254	11097-69-1	0.0078	---	0.23UJ	---	0.24UJ	---	---	0.24UJ	---	---	0.24UJ	---	---	0.24U	---
AROCLOR 1260	11096-82-5	0.0078	---	0.23UJ	---	0.24UJ	---	---	0.24UJ	---	---	0.24UJ	---	---	0.24U	---
TOTAL PCBs		0.044	0.5	1.6UJ	---	1.7UJ	---	---	1.7UJ	---	---	1.7UJ	---	---	1.6U	---
METALS TOTAL (µg/L)																
ALUMINUM	7429-90-5	2000		**18J**	---	100U	---	---	100U	---	---	**107**	---	---	100U	---
ANTIMONY	7440-36-0	0.78	6	0.50U	---	1.0U	---	---	1.0U	---	---	1.0U	---	---	1.0U	---
ARSENIC	7440-38-2	0.052	10	4.0U	---	**8.5**	---	1.0U	**2.9J**	---	1.0U	4.0U	---	1.0U	4.0U	---
BARIUM	7440-39-3	380	2000	**38.7**	---	**50.1**	---	**104**	**92.1**	---	**4.8J**	**4.91**	---	**80.3**	**99.1**	---
BERYLLIUM	7440-41-7	2.5	4	**0.11J**	---	1.0U	---	---	0.2U	---	---	**0.14J**	---	---	0.2U	---
CADMIUM	7440-43-9	0.92	5	0.20U	---	1.0U	---	**2.8**	**1.16**	---	**0.12J**	**0.16J**	---	---	**31.2**	---
CALCIUM	7440-70-2			**48700**	---	**55000**	---	---	**29900**	---	---	**8500**	---	---	**75500**	---
CHROMIUM	7440-47-3	2200	100	5.0U	---	5.0U	---	3.0U	5.0U	---	3.0U	5.0U	---	**2.1J**	**9.68**	---
COBALT	7440-48-4	0.6		**6.7**	---	1.0U	---	---	**1.04**	---	---	**0.944J**	---	---	1.0U	---
COPPER	7440-50-8	80	1300	3.0U	---	3.0U	---	---	3.0U	---	---	3.0U	---	---	**3.65**	---
IRON	7439-89-6	1400		**2960**	---	**4040**	---	---	**6060**	---	---	**581**	---	---	**65J**	---
LEAD	7439-92-1	15	15	0.50U	---	**0.35J**	---	1.0UJ	0.50U	---	1.0UJ	1.0U	---	1.0UJ	1.0U	---
MAGNESIUM	7439-95-4			**12700**	---	**52800**	---	---	**1740**	---	---	**2390**	---	---	**9110**	---
MANGANESE	7439-96-5	43		**944**	---	**1580**	---	---	**38**	---	---	**1340**	---	---	**3.4**	---
MERCURY	7439-97-6	0.063	2	0.1U	---	0.1U	---	0.2U	0.1U	---	0.2U	0.1U	---	0.2U	**0.962**	---
NICKEL	7440-02-0	39		**8.48**	---	2.0U	---	---	**1.0J**	---	---	**0.52J**	---	---	**1.3J**	---
POTASSIUM	7440-09-7			**5430**	---	**14600**	---	---	**16000**	---	---	**1690**	---	---	**9680**	---
SELENIUM	7782-49-2	10	50	3.0U	---	3.0U	---	2.0UJ	3.0U	---	2.0U	5.0U	---	2.0U	5.0U	---
SILVER	7440-22-4	9.4		0.4U	---	0.4U	---	0.1U	0.4U	---	0.1U	0.4U	---	0.1U	0.4U	---
SODIUM	7440-23-5			**27400**	---	**346000**	---	---	**46500**	---	---	**32200**	---	---	**96500**	---
THALLIUM	7440-28-0	0.02	2	0.4U	---	0.4U	---	---	0.4U	---	---	0.4U	---	---	0.4U	---
VANADIUM	7440-62-2	8.6		4.0U	---	**5.1**	---	---	5.0U	---	---	5.0U	---	---	4.0U	---
ZINC	7440-66-6	600		**19**	---	**59.6**	---	---	**21.0**	---	---	**9.6J**	---	---	**12**	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				MW-106D		MW-106S		MW-107			MW-108D			MW-108S		
				BLUE BEACH		BLUE BEACH		BLUE BEACH			BLUE BEACH			BLUE BEACH		
				MW-106D-CI19	MW-106D-CI19-F	MW-106S-CI19	MW-106S-CI19-F	MW-107-A	MW-107-CI19	MW-107-CI19-F	MW-108D-A	MW-108D-CI19	MW-108D-CI19-F	MW-108S-A	MW-108S-CI19	MW-108S-CI19-F
				23-Oct-19	23-Oct-19	22-Oct-19	22-Oct-19	22-Jul-14	24-Oct-19	24-Oct-19	23-Jul-14	24-Oct-19	24-Oct-19	23-Jul-14	24-Oct-19	24-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**													
METALS DISSOLVED (µg/L)																
ALUMINUM, DISSOLVED	7429-90-5	2000		---	**124**	---	**9.5J**	---	---	100U	---	---	100U	---	---	100U
ANTIMONY, DISSOLVED	7440-36-0	0.78	6	---	0.5U	---	0.5U	---	---	1.0U	---	---	1.0U	---	---	1.0U
ARSENIC, DISSOLVED	7440-38-2	0.052	10	---	4.0U	---	**6.7**	---	---	**3.3J**	---	---	4.0U	---	---	4.0U
BARIUM, DISSOLVED	7440-39-3	380	2000	---	**37.6**	---	**31**	---	---	**95.9**	---	---	**4.7**	---	---	**79.4**
BERYLLIUM, DISSOLVED	7440-41-7	2.5	4	---	**0.13J**	---	**0.038J**	---	---	0.2U	---	---	1.0U	---	---	1.0U
CADMIUM, DISSOLVED	7440-43-9	0.92	5	---	0.2U	---	0.2U	---	---	**1.28**	---	---	**0.16J**	---	---	**28**
CALCIUM, DISSOLVED	7440-70-2			---	**46100**	---	**46600**	---	---	**31400**	---	---	**9020**	---	---	**74400**
CHROMIUM, DISSOLVED	7440-47-3	2200	100	---	5.0U	---	5.0U	---	---	5.0U	---	---	5.0U	---	---	5.0U
COBALT, DISSOLVED	7440-48-4	0.6		---	**6.5**	---	**0.14J**	---	---	**1.16**	---	---	1.0U	---	---	1.0U
COPPER, DISSOLVED	7440-50-8	80	1300	---	**1.3J**	---	3.0U	---	---	3.0U	---	---	3.0U	---	---	3.0U
IRON, DISSOLVED	7439-89-6	1400		---	**3090**	---	**3040**	---	---	**6080**	---	---	**277**	---	---	**22J**
LEAD, DISSOLVED	7439-92-1	15	15	---	**0.13J**	---	0.5U	---	---	1.0U	---	---	1.0U	---	---	0.5U
MAGNESIUM, DISSOLVED	7439-95-4			---	**11900**	---	**36700**	---	---	**1890**	---	---	**2510**	---	---	**9330**
MANGANESE, DISSOLVED	7439-96-5	43		---	**896**	---	**1120**	---	---	**48.2**	---	---	**1240**	---	---	**1.3J**
MERCURY, DISSOLVED	7439-97-6	0.063	2	---	0.1U	---	0.1U	---	---	0.2U	---	---	0.2U	---	---	0.2U
NICKEL, DISSOLVED	7440-02-0	39		---	**8**	---	2.0U	---	---	**1.61J**	---	---	**1J**	---	---	**1.8J**
POTASSIUM, DISSOLVED	7440-09-7			---	**5180**	---	**11700**	---	---	**16500**	---	---	**1760**	---	---	**9370**
SELENIUM, DISSOLVED	7782-49-2	10	50	---	3.0U	---	3.0U	---	---	3.0U	---	---	3.0U	---	---	5.0U
SILVER, DISSOLVED	7440-22-4	9.4		---	0.4U	---	**0.067J**	---	---	0.4U	---	---	0.4U	---	---	0.4U
SODIUM, DISSOLVED	7440-23-5			---	**25400**	---	**228000**	---	---	**49900**	---	---	**33700**	---	---	**96200**
THALLIUM, DISSOLVED	7440-28-0	0.02	2	---	0.4U	---	0.4U	---	---	0.4U	---	---	0.4U	---	---	0.4U
VANADIUM, DISSOLVED	7440-62-2	8.6		---	4.0U	---	**2.3J**	---	---	5.0U	---	---	5.0U	---	---	4.0U
ZINC, DISSOLVED	7440-66-6	600		---	**17**	---	**14**	---	---	**35**	---	---	**17**	---	---	**13**

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water
and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds RSL or MCL

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				OW-3			OW-9						TS-3-A		
				KIEFER PARK (LOCATED ON BLUE BEACH FUDS)			KIEFER PARK (LOCATED ON BLUE BEACH FUDS)						BLUE BEACH		
				OW-3-A	OW-3-CI19	OW-3-CI19-F	OW-9-A	OW-99-A	OW-9-ADUP	OW-9-AM	OW-9-CI19	OW-9-CI19-F	TS-3-A-MW2-1720	TS-3-A-MW3-2225	TS-3-A-MW4-2830
				23-Jul-14	29-Oct-19	29-Oct-19	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	22-Oct-19	22-Oct-19	21-Jul-14	21-Jul-14	21-Jul-14
							DUPLICATE	DUPLICATE	DUPLICATE						
ANALYTE	**CAS**	**RSL**	**MCL**												
VOCs (µg/L)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
1,1,1-TRICHLOROETHANE	71-55-6	800	200	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.076	---	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	0.50U
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	---	0.5U	---	---	---	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
1,1,2-TRICHLOROETHANE	79-00-5	0.041	5	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	**0.37J**
1,1-DICHLOROETHANE	75-34-3	2.8	---	5.0U	0.5U	---	0.5U	0.5U	---	**0.12J**	0.5U	---	0.25U	0.25U	0.25U
1,1-DICHLOROETHENE	75-35-4	28	7	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
1,1-DICHLOROPROPENE	563-58-6	---	---	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
1,2,3-TRICHLOROBENZENE	87-61-6	0.7	---	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	7.1U	---	0.25U	0.25U	**0.28J**
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	---	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	**11**	0.25U	0.25U
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	0.2	20U	0.75U	---	2.0U	2.0U	---	0.25U	0.75U	---	0.25U	0.25U	0.25U
1,2-DIBROMOETHANE	106-93-4	---	---	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
1,2-DICHLOROBENZENE	95-50-1	30	600	2.0U	7.0U	---	0.2U	0.2U	---	0.25U	7.1U	---	0.25U	0.25U	**0.22J**
1,2-DICHLOROETHANE	107-06-2	0.17	5	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
1,2-DICHLOROPROPANE	78-87-5	0.82	5	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	**4.2**	0.25U	**0.11J**
1,3-DICHLOROBENZENE	541-73-1	---	---	5.0U	7.0U	---	0.5U	0.5U	---	0.25U	7.1UJ	---	0.25U	0.25U	0.25U
1,3-DICHLOROPROPANE	142-28-9	37	---	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
1,4-DICHLOROBENZENE	106-46-7	0.48	75	2.0U	7.0U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
2,2-DICHLOROPROPANE	594-20-7	---	---	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
2-BUTANONE (MEK)	78-93-3	560	---	50U	2.5U	---	5.0U	5.0U	---	5.0U	2.5U	---	5.0U	5.0U	5.0U
2-CHLOROTOLUENE	95-49-8	24	---	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
2-HEXANONE	591-78-6	3.8	---	50U	2.5U	---	5.0U	5.0U	---	2.5U	2.5U	---	2.5U	2.5U	2.5U
4-CHLOROTOLUENE	106-43-4	25	---	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
4-ISOPROPYLTOLUENE	99-87-6	---	---	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	**0.87**	0.25U	0.25U
4-METHYL-2-PENTANONE	108-10-1	---	---	50U	2.5U	---	5.0U	5.0U	---	2.5U	2.5U	---	2.5UJ	2.5UJ	2.5UJ
ACETONE	67-64-1	1400	---	50U	2.5U	---	**24.4**	**23.9**	---	**18J**	2.5U	---	5.0U	5.0U	5.0U
BENZENE	71-43-2	0.46	5	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	**0.28J**	0.25U	**0.15J**
BROMOBENZENE	108-86-1	6.2	---	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
BROMOMETHANE	74-83-9	0.75	---	10UJ	1.0U	---	1UJ	1UJ	---	0.59U	1.0U	---	0.59U	0.59U	0.59U
BROMOCHLOROMETHANE	74-97-5	8.3	---	5.0U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	0.5U
BROMODICHLOROMETHANE	75-27-4	0.13	80	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
BROMOFORM	75-25-2	3.3	80	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
CARBON DISULFIDE	75-15-0	81	---	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	**1.0**
CARBON TETRACHLORIDE	56-23-5	0.46	5	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
CHLOROBENZENE	108-90-7	7.8	100	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
CHLOROETHANE	75-00-3	2100	---	10UJ	1.0U	---	1.0UJ	1.0UJ	---	0.25U	1.0U	---	0.25U	0.25U	0.25U
CHLOROFORM	67-66-3	0.22	80	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
CHLOROMETHANE	74-87-3	19	---	5.0U	1.0U	---	0.5U	0.5U	---	0.25U	1.0U	---	0.25U	0.25U	0.25U
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	70	**39.2J**	**8.4**	---	**10.1J**	**11.2J**	---	**8.0**	**0.72J**	---	**9.5**	0.25U	**0.13J**
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
DIBROMOCHLOROMETHANE	124-48-1	0.87	80	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
DIBROMOMETHANE	74-95-3	0.83	---	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
DICHLORODIFLUOROMETHANE	75-71-8	20	---	10U	1.0U	---	1.0U	1.0U	---	0.25U	1.0U	---	**1.2**	0.25U	0.25U
DIISOPROPYL ETHER	108-20-3	---	---	---	---	---	---	---	---	0.25U	---	---	0.25U	0.25U	0.25U
ETHYLBENZENE	100-41-4	1.5	700	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	**7.5**	**0.08J**	0.25U
HEXACHLOROBUTADIENE	87-68-3	0.14	---	5.0U	0.75U	---	0.5U	0.5U	---	0.25U	0.75U	---	0.25U	0.25U	0.25U
ISOPROPYLBENZENE	98-82-8	---	---	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	**4**	0.25U	0.25U
METHYL BROMIDE	74-83-9	---	---	10UJ	1.0U	---	1.0UJ	1.0UJ	---	0.59U	1.0U	---	0.59U	0.59U	0.59U
METHYL TERT-BUTYL ETHER	1634-04-4	---	---	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
METHYLENE CHLORIDE	75-09-2	11	5	5.0U	2.5U	---	0.5U	0.5U	---	0.25U	2.5U	---	**0.16J**	0.25U	**0.17J**
NAPHTHALENE	91-20-3	0.17	---	5.0U	0.093U	---	0.5U	0.5U	---	0.25U	0.094U	---	**780**	0.25U	**1.0J**
N-BUTYL BENZENE	104-51-8	---	---	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
N-PROPYL BENZENE	103-65-1	---	---	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	**2.3**	0.25U	0.25U
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	**0.87**	0.25U	0.25U
SEC-BUTYL BENZENE	135-98-8	---	---	**2.8J**	**1.1**	---	0.2U	0.2U	---	0.25U	**0.81J**	---	0.25U	**3.4**	0.25U
STYRENE	100-42-5	120	100	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				OW-3			OW-9						TS-3-A		
				KIEFER PARK (LOCATED ON BLUE BEACH FUDS)			KIEFER PARK (LOCATED ON BLUE BEACH FUDS)						BLUE BEACH		
				OW-3-A	OW-3-CI19	OW-3-CI19-F	OW-9-A	OW-99-A	OW-9-ADUP	OW-9-AM	OW-9-CI19	OW-9-CI19-F	TS-3-A-MW2-1720	TS-3-A-MW3-2225	TS-3-A-MW4-2830
				23-Jul-14	29-Oct-19	29-Oct-19	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	22-Oct-19	22-Oct-19	21-Jul-14	21-Jul-14	21-Jul-14
							DUPLICATE	DUPLICATE	DUPLICATE						
ANALYTE	**CAS**	**RSL**	**MCL**												
VOCs (µg/L)															
TERT-BUTYLBENZENE	98-06-6	69	---	**1.6J**	**0.91J**	---	0.2U	0.2U	---	0.25U	**0.48J**	---	**0.44J**	**1.2**	**0.27J**
TETRACHLOROETHENE	127-18-4	4.1	5	5.0U	**1.4**	---	**0.4J**	**0.4J**	---	**0.37J**	0.5U	---	**1.5**	**0.14J**	**0.14J**
TETRAHYDROFURAN	109-99-9	340	---	---	5.0U	---	---	---	---	2.5U	5U	---	2.5U	2.5U	2.5U
TOLUENE	108-88-3	110	1000	2.0U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	**1**	**0.09J**	**0.14J**
TRANS-1,2-DICHLOROETHENE	156-60-5	36	100	5.0U	0.5U	---	0.5U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	0.2U	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U
TRICHLOROETHYLENE	79-01-6	0.28	5	**134J**	**46**	---	**4.8J**	**5.4J**	---	**4.4**	**3.3**	---	**12**	**0.11J**	**0.49J**
TRICHLOROFLUOROMETHANE	75-69-4	520	---	---	1.0U	---	0.5U	0.5U	---	0.25U	1.0U	---	0.25U	0.25U	0.25U
VINYL CHLORIDE	75-01-4	0.019	2	5.0U	1.0U	---	0.5U	0.5U	---	0.25U	1.0U	---	**2.0**	0.25U	0.25U
XYLENE O	95-47-6	---	---	---	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	**12**	0.25U	0.25U
XYLENE P,M	179601-23-1	---	---	---	1.0U	---	0.4U	0.4U	---	0.5U	1.0U	---	**8.5**	**0.11J**	**0.13J**
TOTAL XYLENES	1330-20-7	19	10000	---	0.5U	---	0.2U	0.2U	---	0.25U	0.5U	---	**20.5**	**0.11J**	**0.13J**
SVOC (µg/L)															
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	---	0.5U	---	---	---	---	---	7.1U	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	30	600	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	---	---	---	7.0U	---	---	---	---	---	7.1UJ	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	---	7.0U	---	---	---	---	---	0.5U	---	---	---	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	71	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
2,4,5-TRICHLOROPHENOL	95-95-4	120	---	---	18U	---	---	---	---	---	18U	---	---	---	---
2,4,6-TRICHLOROPHENOL	88-06-2	1.2	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
2,4-DICHLOROPHENOL	120-83-2	4.6	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
2,4-DIMETHYLPHENOL	105-67-9	36	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
2,4-DINITROPHENOL	51-28-5	3.9	---	---	18U	---	---	---	---	---	18U	---	---	---	---
2,4-DINITROTOLUENE	121-14-2	0.24	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
2,6-DINITROTOLUENE	606-20-2	0.049	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
trans-1,3-Dichloropropene	10061-02-6	---	---	---	0.5U	---	---	---	---	---	0.5U	---	---	---	---
2-CHLORONAPHTHALENE	91-58-7	75	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
2-CHLOROPHENOL	95-57-8	9.1	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	93	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
2-NITROANILINE	88-74-4	19	---	---	18U	---	---	---	---	---	18U	---	---	---	---
2-NITROPHENOL	88-75-5	---	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
3,3'-DICHLOROBENZIDINE	91-94-1	0.13	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
3-NITROANILINE	99-09-2	---	---	---	18U	---	---	---	---	---	18U	---	---	---	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	0.15	---	---	18U	---	---	---	---	---	18U	---	---	---	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
4-CHLORO-3-METHYLPHENOL	59-50-7	140	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
4-CHLOROANILINE	106-47-8	0.37	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
4-NITROANILINE	100-01-6	3.8	---	---	18U	---	---	---	---	---	18U	---	---	---	---
4-NITROPHENOL	100-02-7	---	---	---	18UJ	---	---	---	---	---	18UJ	---	---	---	---
BENZOIC ACID	65-85-0	7500	---	---	18UJ	---	---	---	---	---	18UJ	---	---	---	---
BENZYL ALCOHOL	100-51-6	200	---	---	14U	---	---	---	---	---	14UJ	---	---	---	---
BENZYL BUTYL PHTHALATE	85-68-7	16	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	5.9	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	0.014	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	5.6	6	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
CARBAZOLE	86-74-8	---	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
CRESOLS, M- & P-		---	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
DIBENZOFURAN	132-64-9	0.79	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
DIETHYL PHTHALATE	84-66-2	1500	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
DIMETHYL PHTHALATE	131-11-3	---	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
DI-N-BUTYL PHTHALATE	84-74-2	90	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
DI-N-OCTYL PHTHALATE	117-84-0	20	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
HEXACHLOROBENZENE	118-74-1	0.0098	1	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
HEXACHLOROETHANE	67-72-1	0.33	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
ISOPHORONE	78-59-1	78	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				OW-3			OW-9						TS-3-A		
				KIEFER PARK (LOCATED ON BLUE BEACH FUDS)			KIEFER PARK (LOCATED ON BLUE BEACH FUDS)						BLUE BEACH		
				OW-3-A	OW-3-CI19	OW-3-CI19-F	OW-9-A	OW-99-A	OW-9-ADUP	OW-9-AM	OW-9-CI19	OW-9-CI19-F	TS-3-A-MW2-1720	TS-3-A-MW3-2225	TS-3-A-MW4-2830
				23-Jul-14	29-Oct-19	29-Oct-19	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	22-Oct-19	22-Oct-19	21-Jul-14	21-Jul-14	21-Jul-14
							DUPLICATE	DUPLICATE	DUPLICATE						
ANALYTE	**CAS**	**RSL**	**MCL**												
SVOC (µg/L)															
NITROBENZENE	98-95-3	0.14	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
N-NITROSODIMETHYLAMINE	62-75-9	0.00011	---	---	7.0U	---	---	---	---	---	7.1UJ	---	---	---	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	0.011	---	---	7.0U	---	---	---	---	---	7.1U	---	---	---	---
N-NITROSODIPHENYLAMINE	86-30-6	12	---	---	7.0U	---	---	---	---	---	7.1UJ	---	---	---	---
PENTACHLOROPHENOL	87-86-5	0.041	1	---	18U	---	---	---	---	---	18U	---	---	---	---
PHENOL	108-95-2	580	---	---	7.0U	---	---	---	---	---	7.1UJ	---	---	---	---
PAHs (µg/L)															
1-METHYLNAPHTHALENE	90-12-0	1.1	---	---	0.093U	---	---	---	---	---	0.094U	---	---	---	---
2-METHYLNAPHTHALENE	91-57-6	3.6	---	---	0.093U	---	---	---	---	---	0.094U	---	---	---	---
ACENAPHTHENE	83-32-9	53	---	---	0.093U	---	---	---	---	---	0.094U	---	---	---	---
ACENAPHTHYLENE	208-96-8	---	---	---	0.093U	---	---	---	---	---	0.094U	---	---	---	---
ANTHRACENE	120-12-7	180	---	---	0.093U	---	---	---	---	---	0.094U	---	---	---	---
BENZO(A)ANTHRACENE	56-55-3	0.03	---	---	**0.052J**	---	---	---	---	---	0.094U	---	---	---	---
BENZO(A)PYRENE	50-32-8	0.025	0.2	---	**0.093J**	---	---	---	---	---	0.094U	---	---	---	---
BENZO(B)FLUORANTHENE	205-99-2	0.25	---	---	**0.095J**	---	---	---	---	---	0.094U	---	---	---	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---	---	**0.083J**	---	---	---	---	---	0.094U	---	---	---	---
BENZO(K)FLUORANTHENE	207-08-9	2.5	---	---	**0.072J**	---	---	---	---	---	0.094U	---	---	---	---
CHRYSENE	218-01-9	25	---	---	0.19U	---	---	---	---	---	0.094U	---	---	---	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---	---	0.093U	---	---	---	---	---	0.094U	---	---	---	---
FLUORANTHENE	206-44-0	80	---	---	**0.081J**	---	---	---	---	---	0.094U	---	---	---	---
FLUORENE	86-73-7	29	---	---	0.093U	---	---	---	---	---	0.094U	---	---	---	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---	---	0.093U	---	---	---	---	---	0.094U	---	---	---	---
NAPHTHALENE	91-20-3	0.17	---	---	0.093U	---	---	---	---	---	0.094U	---	---	---	---
PHENANTHRENE	85-01-8	---	---	---	0.093U	---	---	---	---	---	0.094U	---	---	---	---
PYRENE	129-00-0	12	---	---	0.093U	---	---	---	---	---	0.094U	---	---	---	---
PCBs (µg/L)															
AROCLOR 1016	12674-11-2	0.14	---	---	0.23U	---	---	---	---	---	0.23UJ	---	---	---	---
AROCLOR 1221	11104-28-2	0.0047	---	---	0.23U	---	---	---	---	---	0.23UJ	---	---	---	---
AROCLOR 1232	11141-16-5	0.0047	---	---	0.23U	---	---	---	---	---	0.23UJ	---	---	---	---
AROCLOR 1242	53469-21-9	0.0078	---	---	0.23U	---	---	---	---	---	0.23UJ	---	---	---	---
AROCLOR 1248	12672-29-6	0.0078	---	---	0.23U	---	---	---	---	---	0.23UJ	---	---	---	---
AROCLOR 1254	11097-69-1	0.0078	---	---	0.23U	---	---	---	---	---	0.23UJ	---	---	---	---
AROCLOR 1260	11096-82-5	0.0078	---	---	0.23U	---	---	---	---	---	0.23UJ	---	---	---	---
TOTAL PCBs		0.044	0.5	---	1.6U	---	---	---	---	---	1.6UJ	---	---	---	---
METALS TOTAL (µg/L)															
ALUMINUM	7429-90-5	2000		---	100U	---	---	---	---	---	100U	---	---	---	---
ANTIMONY	7440-36-0	0.78	6	---	0.50U	---	---	---	---	---	1.0U	---	---	---	---
ARSENIC	7440-38-2	0.052	10	1.0U	4.0U	---	**4.5**	**4.9**	**5.0**	---	**3.0J**	---	**0.7J**	**10.8J**	**3.6J**
BARIUM	7440-39-3	380	2000	**24.8J**	**6.05**	---	**16.6J**	**17.7J**	**17.6J**	---	**14.5**	---	**9.9J**	**587**	**377**
BERYLLIUM	7440-41-7	2.5	4	---	0.2U	---	---	---	---	---	1.0U	---	---	---	---
CADMIUM	7440-43-9	0.92	5	**0.26**	**0.23J**	---	**1.84**	**1.94**	---	---	1.0U	---	0.1U	**4.81**	**2.84**
CALCIUM	7440-70-2			---	**19800**	---	---	---	---	---	**14400**	---	---	---	---
CHROMIUM	7440-47-3	2200	100	3.0U	5.0U	---	**5.7J**	**6.4J**	**6.2J**	---	5.0U	---	3.0U	**63.3**	**63.5**
COBALT	7440-48-4	0.6		---	**3.48**	---	---	---	---	---	**6.56**	---	---	---	---
COPPER	7440-50-8	80	1300	---	**3.7**	---	---	---	---	---	3.0U	---	---	---	---
IRON	7439-89-6	1400		---	100U	---	---	---	---	---	**6450**	---	---	---	---
LEAD	7439-92-1	15	15	1.0UJ	**0.081J**	---	**0.80J**	1.0UJ	1.0UJ	---	**0.18J**	---	1.0U	**229**	**145**
MAGNESIUM	7439-95-4			---	**5350**	---	---	---	---	---	**2630**	---	---	---	---
MANGANESE	7439-96-5	43		---	**654**	---	---	---	---	---	**3180**	---	---	---	---
MERCURY	7439-97-6	0.063	2	0.2U	0.1U	---	0.2U	0.2U	0.2U	---	0.1U	---	0.2U	0.2U	0.2U
NICKEL	7440-02-0	39		---	**3.63**	---	---	---	---	---	**2.6**	---	---	---	---
POTASSIUM	7440-09-7			---	**3980**	---	---	---	---	---	**3260**	---	---	---	---
SELENIUM	7782-49-2	10	50	2.0U	3.0U	---	2.0U	2.0U	2.0U	---	**0.19J**	---	2.0U	2.0U	2.0U
SILVER	7440-22-4	9.4		0.1U	0.4U	---	0.1U	0.1U	0.1U	---	0.4U	---	0.1U	0.1U	0.1U
SODIUM	7440-23-5			---	**12600**	---	---	---	---	---	**31700**	---	---	---	---
THALLIUM	7440-28-0	0.02	2	---	0.4U	---	---	---	---	---	0.4U	---	---	---	---
VANADIUM	7440-62-2	8.6		---	4.0U	---	---	---	---	---	5.0U	---	---	---	---
ZINC	7440-66-6	600		---	**6.4J**	---	---	---	---	---	**116**	---	---	---	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				OW-3			OW-9						TS-3-A		
				KIEFER PARK (LOCATED ON BLUE BEACH FUDS)			KIEFER PARK (LOCATED ON BLUE BEACH FUDS)						BLUE BEACH		
				OW-3-A	OW-3-CI19	OW-3-CI19-F	OW-9-A	OW-99-A	OW-9-ADUP	OW-9-AM	OW-9-CI19	OW-9-CI19-F	TS-3-A-MW2-1720	TS-3-A-MW3-2225	TS-3-A-MW4-2830
				23-Jul-14	29-Oct-19	29-Oct-19	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	22-Oct-19	22-Oct-19	21-Jul-14	21-Jul-14	21-Jul-14
							DUPLICATE	DUPLICATE	DUPLICATE						
ANALYTE	**CAS**	**RSL**	**MCL**												
METALS DISSOLVED (µg/L)															
ALUMINUM, DISSOLVED	7429-90-5	2000		---	---	100U	---	---	---	---	---	40U	---	---	---
ANTIMONY, DISSOLVED	7440-36-0	0.78	6	---	---	0.5U	---	---	---	---	---	**0.087J**	---	---	---
ARSENIC, DISSOLVED	7440-38-2	0.052	10	---	---	4.0U	---	---	---	---	---	**2.8J**	---	---	---
BARIUM, DISSOLVED	7440-39-3	380	2000	---	---	**6.5**	---	---	---	---	---	**12.4**	---	---	---
BERYLLIUM, DISSOLVED	7440-41-7	2.5	4	---	---	0.2U	---	---	---	---	---	0.2U	---	---	---
CADMIUM, DISSOLVED	7440-43-9	0.92	5	---	---	**0.2J**	---	---	---	---	---	1.0U	---	---	---
CALCIUM, DISSOLVED	7440-70-2			---	---	**20400**	---	---	---	---	---	**14700**	---	---	---
CHROMIUM, DISSOLVED	7440-47-3	2200	100	---	---	5.0U	---	---	---	---	---	5.0U	---	---	---
COBALT, DISSOLVED	7440-48-4	0.6		---	---	**2.59**	---	---	---	---	---	**6.5**	---	---	---
COPPER, DISSOLVED	7440-50-8	80	1300	---	---	**3.53**	---	---	---	---	---	3.0U	---	---	---
IRON, DISSOLVED	7439-89-6	1400		---	---	100U	---	---	---	---	---	**5780**	---	---	---
LEAD, DISSOLVED	7439-92-1	15	15	---	---	0.5U	---	---	---	---	---	0.5U	---	---	---
MAGNESIUM, DISSOLVED	7439-95-4			---	---	**5330**	---	---	---	---	---	**2640**	---	---	---
MANGANESE, DISSOLVED	7439-96-5	43		---	---	**639**	---	---	---	---	---	**3230**	---	---	---
MERCURY, DISSOLVED	7439-97-6	0.063	2	---	---	0.1U	---	---	---	---	---	0.1U	---	---	---
NICKEL, DISSOLVED	7440-02-0	39		---	---	**3.64**	---	---	---	---	---	**2.57**	---	---	---
POTASSIUM, DISSOLVED	7440-09-7			---	---	**3930**	---	---	---	---	---	**3490**	---	---	---
SELENIUM, DISSOLVED	7782-49-2	10	50	---	---	3.0U	---	---	---	---	---	3.0U	---	---	---
SILVER, DISSOLVED	7440-22-4	9.4		---	---	0.4U	---	---	---	---	---	0.4U	---	---	---
SODIUM, DISSOLVED	7440-23-5			---	---	**12500**	---	---	---	---	---	**34700**	---	---	---
THALLIUM, DISSOLVED	7440-28-0	0.02	2	---	---	0.4U	---	---	---	---	---	0.4U	---	---	---
VANADIUM, DISSOLVED	7440-62-2	8.6		---	---	4.0U	---	---	---	---	---	**0.7J**	---	---	---
ZINC, DISSOLVED	7440-66-6	600		---	---	**7.5J**	---	---	---	---	---	**98.4**	---	---	---

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water
and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds RSL or MCL

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				TS-3-B				TS-3-C				TS-3-D	
				BLUE BEACH				BLUE BEACH				BLUE BEACH	
				TS-3-B-MW1-1517	TS-3-B-MW3-2526	TS-3-B-MW4-3031	TS-3-B-MW6-3940	TS-3-C-MW1-1415	S-3-C-MW1-1415-FDU	TS-3-C-MW2-1820	TS-3-C-MW3-2324	TS-3-D-MW2-1921	TS-3-D-MW1-1315
				21-Jul-14	21-Jul-14	22-Jul-14	21-Jul-14	22-Jul-14	22-Jul-14	22-Jul-14	22-Jul-14	05-Aug-14	05-Aug-14
								DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**RSL**	**MCL**										
VOCs (µg/L)													
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,1,1-TRICHLOROETHANE	71-55-6	800	200	0.25U	0.25U	0.25U	0.25U	**0.17J**	---	0.25U	---	0.25U	**0.19J**
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.076	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,1,2-TRICHLOROETHANE	79-00-5	0.041	5	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,1-DICHLOROETHANE	75-34-3	2.8	---	0.25U	0.25U	0.25U	0.25U	**0.13J**	---	**0.29J**	---	**3.2**	**0.26J**
1,1-DICHLOROETHENE	75-35-4	28	7	0.25U	**0.14J**	0.25U	**0.22J**	0.25U	---	0.25U	---	0.25U	0.25U
1,1-DICHLOROPROPENE	563-58-6	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,2,3-TRICHLOROBENZENE	87-61-6	0.7	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25UJ	0.25UJ
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	---	**0.08J**	0.25U	0.25U	0.25U	0.25U	---	**0.14J**	---	0.25U	0.25U
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	0.2	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,2-DIBROMOETHANE	106-93-4	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,2-DICHLOROBENZENE	95-50-1	30	600	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,2-DICHLOROETHANE	107-06-2	0.17	5	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,2-DICHLOROPROPANE	78-87-5	0.82	5	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	**0.94**
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,3-DICHLOROBENZENE	541-73-1	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,3-DICHLOROPROPANE	142-28-9	37	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
1,4-DICHLOROBENZENE	106-46-7	0.48	75	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
2,2-DICHLOROPROPANE	594-20-7	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
2-BUTANONE (MEK)	78-93-3	560	---	5.0U	5.0U	5.0U	5.0U	5.0U	---	5.0U	---	5.0U	5.0U
2-CHLOROTOLUENE	95-49-8	24	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
2-HEXANONE	591-78-6	3.8	---	2.5U	2.5U	2.5U	2.5U	2.5U	---	2.5U	---	2.5U	2.5U
4-CHLOROTOLUENE	106-43-4	25	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
4-ISOPROPYLTOLUENE	99-87-6	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
4-METHYL-2-PENTANONE	108-10-1	---	---	2.5UJ	2.5U	2.5U	2.5UJ	2.5U	---	2.5U	---	2.5U	2.5U
ACETONE	67-64-1	1400	---	5.0U	5.0U	5.0U	5.0U	5.0U	---	5.0U	---	5.0U	5.0U
BENZENE	71-43-2	0.46	5	0.25U	0.25U	**0.10J**	0.25U	0.25U	---	**0.18J**	---	**0.12J**	0.25U
BROMOBENZENE	108-86-1	6.2	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
BROMOMETHANE	74-83-9	0.75	---	0.59U	0.59U	0.59U	0.59U	0.59U	---	0.59U	---	0.59U	0.59U
BROMOCHLOROMETHANE	74-97-5	8.3	---	0.5U	0.5U	0.5U	0.5U	0.5U	---	0.5U	---	0.5U	0.5U
BROMODICHLOROMETHANE	75-27-4	0.13	80	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
BROMOFORM	75-25-2	3.3	80	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
CARBON DISULFIDE	75-15-0	81	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
CARBON TETRACHLORIDE	56-23-5	0.46	5	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
CHLOROBENZENE	108-90-7	7.8	100	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
CHLOROETHANE	75-00-3	2100	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
CHLOROFORM	67-66-3	0.22	80	0.25U	0.25U	0.25U	0.25U	**0.13J**	---	**0.10J**	---	**0.63**	**0.19J**
CHLOROMETHANE	74-87-3	19	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	**0.51J**	0.25U
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	70	**2.3**	**1.5**	**0.38J**	**0.90**	**1.7**	---	**2.7**	---	**39**	**1.7**
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
DIBROMOCHLOROMETHANE	124-48-1	0.87	80	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
DIBROMOMETHANE	74-95-3	0.83	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
DICHLORODIFLUOROMETHANE	75-71-8	20	---	**2.9**	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
DIISOPROPYL ETHER	108-20-3	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
ETHYLBENZENE	100-41-4	1.5	700	0.25U	0.25U	0.25U	0.25U	0.25U	---	**0.09J**	---	0.25U	0.25U
HEXACHLOROBUTADIENE	87-68-3	0.14	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
ISOPROPYLBENZENE	98-82-8	---	---	0.25U	**0.18J**	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
METHYL BROMIDE	74-83-9	---	---	0.59U	0.59U	0.59U	0.59U	0.59U	---	0.59U	---	0.59U	0.59U
METHYL TERT-BUTYL ETHER	1634-04-4	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
METHYLENE CHLORIDE	75-09-2	11	5	0.25U	0.25U	0.25U	0.25U	0.25U	---	**0.17J**	---	**0.26J**	0.25U
NAPHTHALENE	91-20-3	0.17	---	**0.65J**	**0.20J**	**0.97J**	**1.8J**	0.25U	---	**0.18J**	---	0.25U	0.25U
N-BUTYL BENZENE	104-51-8	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
N-PROPYL BENZENE	103-65-1	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
SEC-BUTYL BENZENE	135-98-8	---	---	**1.4**	**0.56**	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
STYRENE	100-42-5	120	100	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U

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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				TS-3-B				TS-3-C				TS-3-D	
				BLUE BEACH				BLUE BEACH				BLUE BEACH	
				TS-3-B-MW1-1517	TS-3-B-MW3-2526	TS-3-B-MW4-3031	TS-3-B-MW6-3940	TS-3-C-MW1-1415	S-3-C-MW1-1415-FDU	TS-3-C-MW2-1820	TS-3-C-MW3-2324	TS-3-D-MW2-1921	TS-3-D-MW1-1315
				21-Jul-14	21-Jul-14	22-Jul-14	21-Jul-14	22-Jul-14	22-Jul-14	22-Jul-14	22-Jul-14	05-Aug-14	05-Aug-14
								DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**RSL**	**MCL**										
VOCs (µg/L)													
TERT-BUTYLBENZENE	98-06-6	69	---	**0.45J**	**0.20J**	**0.38J**	**0.31J**	0.25U	---	0.25U	---	0.25U	0.25U
TETRACHLOROETHENE	127-18-4	4.1	5	**0.6**	**0.13J**	0.25U	0.25U	**0.61**	---	**0.23J**	---	**3.7**	**1.8**
TETRAHYDROFURAN	109-99-9	340	---	2.5U	2.5U	2.5U	2.5U	2.5U	---	2.5U	---	2.5U	2.5U
TOLUENE	108-88-3	110	1000	**0.09J**	**0.08J**	**0.08J**	0.25U	**0.11J**	---	**0.24J**	---	0.25U	0.25U
TRANS-1,2-DICHLOROETHENE	156-60-5	36	100	0.25U	0.25U	0.25U	**0.15J**	0.25U	---	0.25U	---	**0.41J**	0.25U
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
TRICHLOROETHYLENE	79-01-6	0.28	5	**12**	**0.60J**	**3.5J**	**5.2**	**74J**	---	**21J**	---	**180**	**75**
TRICHLOROFLUOROMETHANE	75-69-4	520	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
VINYL CHLORIDE	75-01-4	0.019	2	**1.2**	0.25U	0.25U	0.25U	0.25U	---	0.25U	---	0.25U	0.25U
XYLENE O	95-47-6	---	---	**0.12J**	0.25U	0.25U	0.25U	0.25U	---	**0.09J**	---	0.25U	0.25U
XYLENE P,M	179601-23-1	---	---	0.5U	**0.09J**	0.5U	0.5U	0.5U	---	**0.22J**	---	0.5U	0.5U
TOTAL XYLENES	1330-20-7	19	10000	**0.12J**	**0.09J**	0.25U	0.25U	0.25U	---	**0.31J**	---	0.25U	0.25U
SVOC (µg/L)													
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	---	---	---	---	---	---	---	---	---	---
1,2-DICHLOROBENZENE	95-50-1	30	600	---	---	---	---	---	---	---	---	---	---
1,3-DICHLOROBENZENE	541-73-1	---	---	---	---	---	---	---	---	---	---	---	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	---	---	---	---	---	---	---	---	---	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	71	---	---	---	---	---	---	---	---	---	---	---
2,4,5-TRICHLOROPHENOL	95-95-4	120	---	---	---	---	---	---	---	---	---	---	---
2,4,6-TRICHLOROPHENOL	88-06-2	1.2	---	---	---	---	---	---	---	---	---	---	---
2,4-DICHLOROPHENOL	120-83-2	4.6	---	---	---	---	---	---	---	---	---	---	---
2,4-DIMETHYLPHENOL	105-67-9	36	---	---	---	---	---	---	---	---	---	---	---
2,4-DINITROPHENOL	51-28-5	3.9	---	---	---	---	---	---	---	---	---	---	---
2,4-DINITROTOLUENE	121-14-2	0.24	---	---	---	---	---	---	---	---	---	---	---
2,6-DINITROTOLUENE	606-20-2	0.049	---	---	---	---	---	---	---	---	---	---	---
trans-1,3-Dichloropropene	10061-02-6	---	---	---	---	---	---	---	---	---	---	---	---
2-CHLORONAPHTHALENE	91-58-7	75	---	---	---	---	---	---	---	---	---	---	---
2-CHLOROPHENOL	95-57-8	9.1	---	---	---	---	---	---	---	---	---	---	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	93	---	---	---	---	---	---	---	---	---	---	---
2-NITROANILINE	88-74-4	19	---	---	---	---	---	---	---	---	---	---	---
2-NITROPHENOL	88-75-5	---	---	---	---	---	---	---	---	---	---	---	---
3,3'-DICHLOROBENZIDINE	91-94-1	0.13	---	---	---	---	---	---	---	---	---	---	---
3-NITROANILINE	99-09-2	---	---	---	---	---	---	---	---	---	---	---	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	0.15	---	---	---	---	---	---	---	---	---	---	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---	---	---	---	---	---	---	---	---	---	---
4-CHLORO-3-METHYLPHENOL	59-50-7	140	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROANILINE	106-47-8	0.37	---	---	---	---	---	---	---	---	---	---	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---	---	---	---	---	---	---	---	---	---	---
4-NITROANILINE	100-01-6	3.8	---	---	---	---	---	---	---	---	---	---	---
4-NITROPHENOL	100-02-7	---	---	---	---	---	---	---	---	---	---	---	---
BENZOIC ACID	65-85-0	7500	---	---	---	---	---	---	---	---	---	---	---
BENZYL ALCOHOL	100-51-6	200	---	---	---	---	---	---	---	---	---	---	---
BENZYL BUTYL PHTHALATE	85-68-7	16	---	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	5.9	---	---	---	---	---	---	---	---	---	---	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	0.014	---	---	---	---	---	---	---	---	---	---	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	5.6	6	---	---	---	---	---	---	---	---	---	---
CARBAZOLE	86-74-8	---	---	---	---	---	---	---	---	---	---	---	---
CRESOLS, M- & P-		---	---	---	---	---	---	---	---	---	---	---	---
DIBENZOFURAN	132-64-9	0.79	---	---	---	---	---	---	---	---	---	---	---
DIETHYL PHTHALATE	84-66-2	1500	---	---	---	---	---	---	---	---	---	---	---
DIMETHYL PHTHALATE	131-11-3	---	---	---	---	---	---	---	---	---	---	---	---
DI-N-BUTYL PHTHALATE	84-74-2	90	---	---	---	---	---	---	---	---	---	---	---
DI-N-OCTYL PHTHALATE	117-84-0	20	---	---	---	---	---	---	---	---	---	---	---
HEXACHLOROBENZENE	118-74-1	0.0098	1	---	---	---	---	---	---	---	---	---	---
HEXACHLOROETHANE	67-72-1	0.33	---	---	---	---	---	---	---	---	---	---	---
ISOPHORONE	78-59-1	78	---	---	---	---	---	---	---	---	---	---	---

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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				TS-3-B				TS-3-C				TS-3-D	
				BLUE BEACH				BLUE BEACH				BLUE BEACH	
				TS-3-B-MW1-1517	TS-3-B-MW3-2526	TS-3-B-MW4-3031	TS-3-B-MW6-3940	TS-3-C-MW1-1415	S-3-C-MW1-1415-FDU	TS-3-C-MW2-1820	TS-3-C-MW3-2324	TS-3-D-MW2-1921	TS-3-D-MW1-1315
				21-Jul-14	21-Jul-14	22-Jul-14	21-Jul-14	22-Jul-14	22-Jul-14	22-Jul-14	22-Jul-14	05-Aug-14	05-Aug-14
								DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**RSL**	**MCL**										
SVOC (µg/L)													
NITROBENZENE	98-95-3	0.14	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIMETHYLAMINE	62-75-9	0.00011	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	0.011	---	---	---	---	---	---	---	---	---	---	---
N-NITROSODIPHENYLAMINE	86-30-6	12	---	---	---	---	---	---	---	---	---	---	---
PENTACHLOROPHENOL	87-86-5	0.041	1	---	---	---	---	---	---	---	---	---	---
PHENOL	108-95-2	580	---	---	---	---	---	---	---	---	---	---	---
PAHs (µg/L)													
1-METHYLNAPHTHALENE	90-12-0	1.1	---	---	---	---	---	---	---	---	---	---	---
2-METHYLNAPHTHALENE	91-57-6	3.6	---	---	---	---	---	---	---	---	---	---	---
ACENAPHTHENE	83-32-9	53	---	---	---	---	---	---	---	---	---	---	---
ACENAPHTHYLENE	208-96-8	---	---	---	---	---	---	---	---	---	---	---	---
ANTHRACENE	120-12-7	180	---	---	---	---	---	---	---	---	---	---	---
BENZO(A)ANTHRACENE	56-55-3	0.03	---	---	---	---	---	---	---	---	---	---	---
BENZO(A)PYRENE	50-32-8	0.025	0.2	---	---	---	---	---	---	---	---	---	---
BENZO(B)FLUORANTHENE	205-99-2	0.25	---	---	---	---	---	---	---	---	---	---	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---	---	---	---	---	---	---	---	---	---	---
BENZO(K)FLUORANTHENE	207-08-9	2.5	---	---	---	---	---	---	---	---	---	---	---
CHRYSENE	218-01-9	25	---	---	---	---	---	---	---	---	---	---	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---	---	---	---	---	---	---	---	---	---	---
FLUORANTHENE	206-44-0	80	---	---	---	---	---	---	---	---	---	---	---
FLUORENE	86-73-7	29	---	---	---	---	---	---	---	---	---	---	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---	---	---	---	---	---	---	---	---	---	---
NAPHTHALENE	91-20-3	0.17	---	---	---	---	---	---	---	---	---	---	---
PHENANTHRENE	85-01-8	---	---	---	---	---	---	---	---	---	---	---	---
PYRENE	129-00-0	12	---	---	---	---	---	---	---	---	---	---	---
PCBs (µg/L)													
AROCLOR 1016	12674-11-2	0.14	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2	0.0047	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5	0.0047	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9	0.0078	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6	0.0078	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1	0.0078	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5	0.0078	---	---	---	---	---	---	---	---	---	---	---
TOTAL PCBs		0.044	0.5	---	---	---	---	---	---	---	---	---	---
METALS TOTAL (µg/L)													
ALUMINUM	7429-90-5	2000		---	---	---	---	---	---	---	---	---	---
ANTIMONY	7440-36-0	0.78	6	---	---	---	---	---	---	---	---	---	---
ARSENIC	7440-38-2	0.052	10	**0.5J**	**3.2J**	**5.9J**	1.0U	1.0U	1.0U	**1.7J**	1.0U	3.0U	3.0U
BARIUM	7440-39-3	380	2000	**20.4J**	**19.3J**	**237**	**24.5J**	**12.5J**	**12.1J**	**39.9**	**12.1J**	**43.5J**	**20.6J**
BERYLLIUM	7440-41-7	2.5	4	---	---	---	---	---	---	---	---	---	---
CADMIUM	7440-43-9	0.92	5	0.12U	0.1U	**1.91**	0.22U	**0.12J**	**0.03J**	0.16U	0.18U	0.5U	0.62U
CALCIUM	7440-70-2			---	---	---	---	---	---	---	---	---	---
CHROMIUM	7440-47-3	2200	100	**24.1**	**33.4**	**276**	3.0U	3.0UJ	3.0U	**60.8**	**16.8**	3.0U	**1.5J**
COBALT	7440-48-4	0.6		---	---	---	---	---	---	---	---	---	---
COPPER	7440-50-8	80	1300	---	---	---	---	---	---	---	---	---	---
IRON	7439-89-6	1400		---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	15	15	**3.0**	**6.2**	**76.5**	**1.0J**	1.0UJ	1.0U	**5**	**2.6**	**2.6J**	**3.4J**
MAGNESIUM	7439-95-4			---	---	---	---	---	---	---	---	---	---
MANGANESE	7439-96-5	43		---	---	---	---	---	---	---	---	---	---
MERCURY	7439-97-6	0.063	2	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U
NICKEL	7440-02-0	39		---	---	---	---	---	---	---	---	---	---
POTASSIUM	7440-09-7			---	---	---	---	---	---	---	---	---	---
SELENIUM	7782-49-2	10	50	2.0U	2.0U	2.0U	2.0U	**1.1J**	**1.0J**	2.0U	2.0U	6.0U	**6**
SILVER	7440-22-4	9.4		0.1U	0.1U	0.1U	0.1U	**0.13J**	0.1UJ	0.1U	0.1U	0.3U	**0.3**
SODIUM	7440-23-5			---	---	---	---	---	---	---	---	---	---
THALLIUM	7440-28-0	0.02	2	---	---	---	---	---	---	---	---	---	---
VANADIUM	7440-62-2	8.6		---	---	---	---	---	---	---	---	---	---
ZINC	7440-66-6	600		---	---	---	---	---	---	---	---	---	---

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North Kingstown, Rhode Island

				TS-3-B				TS-3-C				TS-3-D	
				BLUE BEACH				BLUE BEACH				BLUE BEACH	
				TS-3-B-MW1-1517	TS-3-B-MW3-2526	TS-3-B-MW4-3031	TS-3-B-MW6-3940	TS-3-C-MW1-1415	S-3-C-MW1-1415-FDU	TS-3-C-MW2-1820	TS-3-C-MW3-2324	TS-3-D-MW2-1921	TS-3-D-MW1-1315
				21-Jul-14	21-Jul-14	22-Jul-14	21-Jul-14	22-Jul-14	22-Jul-14	22-Jul-14	22-Jul-14	05-Aug-14	05-Aug-14
								DUPLICATE	DUPLICATE				
ANALYTE	**CAS**	**RSL**	**MCL**										
METALS DISSOLVED (µg/L)													
ALUMINUM, DISSOLVED	7429-90-5	2000		---	---	---	---	---	---	---	---	---	---
ANTIMONY, DISSOLVED	7440-36-0	0.78	6	---	---	---	---	---	---	---	---	---	---
ARSENIC, DISSOLVED	7440-38-2	0.052	10	---	---	---	---	---	---	---	---	---	---
BARIUM, DISSOLVED	7440-39-3	380	2000	---	---	---	---	---	---	---	---	---	---
BERYLLIUM, DISSOLVED	7440-41-7	2.5	4	---	---	---	---	---	---	---	---	---	---
CADMIUM, DISSOLVED	7440-43-9	0.92	5	---	---	---	---	---	---	---	---	---	---
CALCIUM, DISSOLVED	7440-70-2			---	---	---	---	---	---	---	---	---	---
CHROMIUM, DISSOLVED	7440-47-3	2200	100	---	---	---	---	---	---	---	---	---	---
COBALT, DISSOLVED	7440-48-4	0.6		---	---	---	---	---	---	---	---	---	---
COPPER, DISSOLVED	7440-50-8	80	1300	---	---	---	---	---	---	---	---	---	---
IRON, DISSOLVED	7439-89-6	1400		---	---	---	---	---	---	---	---	---	---
LEAD, DISSOLVED	7439-92-1	15	15	---	---	---	---	---	---	---	---	---	---
MAGNESIUM, DISSOLVED	7439-95-4			---	---	---	---	---	---	---	---	---	---
MANGANESE, DISSOLVED	7439-96-5	43		---	---	---	---	---	---	---	---	---	---
MERCURY, DISSOLVED	7439-97-6	0.063	2	---	---	---	---	---	---	---	---	---	---
NICKEL, DISSOLVED	7440-02-0	39		---	---	---	---	---	---	---	---	---	---
POTASSIUM, DISSOLVED	7440-09-7			---	---	---	---	---	---	---	---	---	---
SELENIUM, DISSOLVED	7782-49-2	10	50	---	---	---	---	---	---	---	---	---	---
SILVER, DISSOLVED	7440-22-4	9.4		---	---	---	---	---	---	---	---	---	---
SODIUM, DISSOLVED	7440-23-5			---	---	---	---	---	---	---	---	---	---
THALLIUM, DISSOLVED	7440-28-0	0.02	2	---	---	---	---	---	---	---	---	---	---
VANADIUM, DISSOLVED	7440-62-2	8.6		---	---	---	---	---	---	---	---	---	---
ZINC, DISSOLVED	7440-66-6	600		---	---	---	---	---	---	---	---	---	---

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water
and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds RSL or MCL

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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				TS-UP-1						TS-UP-2			PZ-1		PZ-2	
				BLUE BEACH						BLUE BEACH			BLUE BEACH		BLUE BEACH	
				TS-UP-1-MW1-1316	TS-UP-1-MW2-1821	TS-UP-1-MW4-2427	TS-UP-1-MW5-3033	TS-UP-1-MW6-3940	S-UP-1-MW6-3940DU	TS-UP-2-MW1-1316	TS-UP-2-MW2-1821	TS-UP-2-MW3-2225	PZ-1-CI19	PZ-1-CI19-F	PZ-2-CI19	PZ-2-CI19-F
				23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	24-Jul-14	24-Jul-14	23-Jul-14	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19
								DUPLICATE	DUPLICATE							
ANALYTE	**CAS**	**RSL**	**MCL**													
VOCs (µg/L)																
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,1,1-TRICHLOROETHANE	71-55-6	800	200	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.076	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,1,2-TRICHLOROETHANE	79-00-5	0.041	5	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,1-DICHLOROETHANE	75-34-3	2.8	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,1-DICHLOROETHENE	75-35-4	28	7	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,1-DICHLOROPROPENE	563-58-6	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,2,3-TRICHLOROBENZENE	87-61-6	0.7	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	7.1U	---	7.1U	---
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	0.2	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.75U	---	0.75U	---
1,2-DIBROMOETHANE	106-93-4	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	7.1U	---	0.5U	---
1,2-DICHLOROETHANE	107-06-2	0.17	5	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,2-DICHLOROPROPANE	78-87-5	0.82	5	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,3-DICHLOROPROPANE	142-28-9	37	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	7.1U	---
2,2-DICHLOROPROPANE	594-20-7	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
2-BUTANONE (MEK)	78-93-3	560	---	5.0U	5.0U	5.0U	5.0U	5.0U	---	5.0U	5.0U	5.0U	2.5U	---	2.5U	---
2-CHLOROTOLUENE	95-49-8	24	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
2-HEXANONE	591-78-6	3.8	---	2.5U	2.5U	2.5U	2.5U	2.5U	---	2.5U	2.5U	2.5U	2.5U	---	2.5U	---
4-CHLOROTOLUENE	106-43-4	25	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
4-ISOPROPYLTOLUENE	99-87-6	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	**0.1J**	0.5U	---	0.5U	---
4-METHYL-2-PENTANONE	108-10-1	---	---	2.5U	2.5U	2.5U	2.5U	2.5U	---	2.5U	2.5U	2.5U	2.5U	---	2.5U	---
ACETONE	67-64-1	1400	---	5.0U	5.0U	5.0U	5.0U	5.0U	---	5.0U	5.0U	5.0U	2.5U	---	2.5U	---
BENZENE	71-43-2	0.46	5	0.25U	0.25U	0.25U	0.25U	**0.14J**	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
BROMOBENZENE	108-86-1	6.2	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
BROMOMETHANE	74-83-9	0.75	---	0.59U	0.59U	0.59U	0.59U	0.59U	---	0.59U	0.59U	0.59U	1.0U	---	1.0U	---
BROMOCHLOROMETHANE	74-97-5	8.3	---	0.5U	0.5U	0.5U	0.5U	0.5U	---	0.5U	0.5U	0.5U	0.5U	---	0.5U	---
BROMODICHLOROMETHANE	75-27-4	0.13	80	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
BROMOFORM	75-25-2	3.3	80	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
CARBON DISULFIDE	75-15-0	81	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	**0.83J**	---
CARBON TETRACHLORIDE	56-23-5	0.46	5	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
CHLOROBENZENE	108-90-7	7.8	100	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
CHLOROETHANE	75-00-3	2100	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	1.0U	---	1.0U	---
CHLOROFORM	67-66-3	0.22	80	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
CHLOROMETHANE	74-87-3	19	---	0.25U	0.25U	0.25U	**0.47J**	**0.47J**	---	0.25U	0.25U	0.25U	1.0U	---	1.0U	---
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	70	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	**6.7**	---	**0.24J**	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
DIBROMOCHLOROMETHANE	124-48-1	0.87	80	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
DIBROMOMETHANE	74-95-3	0.83	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
DICHLORODIFLUOROMETHANE	75-71-8	20	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	1.0U	---	1.0U	---
DIISOPROPYL ETHER	108-20-3	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	---	---	---	---
ETHYLBENZENE	100-41-4	1.5	700	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
HEXACHLOROBUTADIENE	87-68-3	0.14	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.75U	---	0.75U	---
ISOPROPYLBENZENE	98-82-8	---	---	0.25U	0.25U	**0.11J**	0.25U	0.25U	---	0.25U	**0.22J**	**0.32J**	0.5U	---	0.5U	---
METHYL BROMIDE	74-83-9	---	---	0.59U	0.59U	0.59U	0.59U	0.59U	---	0.59U	0.59U	0.59U	1.0U	---	1.0U	---
METHYL TERT-BUTYL ETHER	1634-04-4	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
METHYLENE CHLORIDE	75-09-2	11	5	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	2.5U	---	2.5U	---
NAPHTHALENE	91-20-3	0.17	---	0.25U	0.25U	0.25U	**0.19J**	0.25U	---	0.25U	**0.21J**	0.25U	0.095U	---	0.095U	---
N-BUTYL BENZENE	104-51-8	---	---	0.25U	0.25U	**0.21J**	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
N-PROPYL BENZENE	103-65-1	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	**0.1J**	0.5U	---	0.5U	---
SEC-BUTYL BENZENE	135-98-8	---	---	0.25U	**0.78**	**2.0**	**1.5**	**0.84**	---	0.25U	**2.5**	**3.8**	0.5U	---	0.5U	---
STYRENE	100-42-5	120	100	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				TS-UP-1						TS-UP-2			PZ-1		PZ-2	
				BLUE BEACH						BLUE BEACH			BLUE BEACH		BLUE BEACH	
				TS-UP-1-MW1-1316	TS-UP-1-MW2-1821	TS-UP-1-MW4-2427	TS-UP-1-MW5-3033	TS-UP-1-MW6-3940	S-UP-1-MW6-3940DU	TS-UP-2-MW1-1316	TS-UP-2-MW2-1821	TS-UP-2-MW3-2225	PZ-1-CI19	PZ-1-CI19-F	PZ-2-CI19	PZ-2-CI19-F
				23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	24-Jul-14	24-Jul-14	23-Jul-14	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19
								DUPLICATE	DUPLICATE							
ANALYTE	**CAS**	**RSL**	**MCL**													
VOCs (µg/L)																
TERT-BUTYLBENZENE	98-06-6	69	---	0.25U	**0.39J**	**1.2**	**1.1**	**0.85**	---	0.25U	**1.4**	**2.2**	0.5U	---	0.5U	---
TETRACHLOROETHENE	127-18-4	4.1	5	**0.22J**	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
TETRAHYDROFURAN	109-99-9	340	---	2.5U	2.5U	2.5U	2.5U	2.5U	---	2.5U	2.5U	2.5U	**2.8J**	---	5.0U	---
TOLUENE	108-88-3	110	1000	0.25U	0.25U	0.25U	**0.16J**	**0.15J**	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
TRANS-1,2-DICHLOROETHENE	156-60-5	36	100	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	**1.2**	---	0.5U	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
TRICHLOROETHYLENE	79-01-6	0.28	5	**1.4**	0.25U	0.25U	**0.43J**	**0.91**	---	0.25U	0.25U	0.25U	**1.2**	---	0.5U	---
TRICHLOROFLUOROMETHANE	75-69-4	520	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	1.0U	---	1.0U	---
VINYL CHLORIDE	75-01-4	0.019	2	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	1.0U	---	1.0U	---
XYLENE O	95-47-6	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
XYLENE P,M	179601-23-1	---	---	0.5U	0.5U	0.5U	0.5U	0.5U	---	0.5U	0.5U	0.5U	1.0U	---	1.0U	---
TOTAL XYLENES	1330-20-7	19	10000	0.25U	0.25U	0.25U	0.25U	0.25U	---	0.25U	0.25U	0.25U	0.5U	---	0.5U	---
SVOC (µg/L)																
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	---	---	---	---	---	---	---	---	---	7.1U	---	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	---	---	---	---	---	---	---	---	---	0.5U	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	---	---	---	---	---	---	---	---	---	0.5U	---	7.1U	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	71	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
2,4,5-TRICHLOROPHENOL	95-95-4	120	---	---	---	---	---	---	---	---	---	---	18U	---	18U	---
2,4,6-TRICHLOROPHENOL	88-06-2	1.2	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
2,4-DICHLOROPHENOL	120-83-2	4.6	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
2,4-DIMETHYLPHENOL	105-67-9	36	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
2,4-DINITROPHENOL	51-28-5	3.9	---	---	---	---	---	---	---	---	---	---	18U	---	18U	---
2,4-DINITROTOLUENE	121-14-2	0.24	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
2,6-DINITROTOLUENE	606-20-2	0.049	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
trans-1,3-Dichloropropene	10061-02-6	---	---	---	---	---	---	---	---	---	---	---	0.5U	---	0.5U	---
2-CHLORONAPHTHALENE	91-58-7	75	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
2-CHLOROPHENOL	95-57-8	9.1	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	93	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
2-NITROANILINE	88-74-4	19	---	---	---	---	---	---	---	---	---	---	18U	---	18U	---
2-NITROPHENOL	88-75-5	---	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
3,3'-DICHLOROBENZIDINE	91-94-1	0.13	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
3-NITROANILINE	99-09-2	---	---	---	---	---	---	---	---	---	---	---	18U	---	18U	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	0.15	---	---	---	---	---	---	---	---	---	---	18U	---	18U	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
4-CHLORO-3-METHYLPHENOL	59-50-7	140	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
4-CHLOROANILINE	106-47-8	0.37	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
4-NITROANILINE	100-01-6	3.8	---	---	---	---	---	---	---	---	---	---	18U	---	18U	---
4-NITROPHENOL	100-02-7	---	---	---	---	---	---	---	---	---	---	---	18UJ	---	18UJ	---
BENZOIC ACID	65-85-0	7500	---	---	---	---	---	---	---	---	---	---	18UJ	---	18UJ	---
BENZYL ALCOHOL	100-51-6	200	---	---	---	---	---	---	---	---	---	---	14UJ	---	14UJ	---
BENZYL BUTYL PHTHALATE	85-68-7	16	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	5.9	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	0.014	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	5.6	6	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
CARBAZOLE	86-74-8	---	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
CRESOLS, M- & P-		---	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
DIBENZOFURAN	132-64-9	0.79	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
DIETHYL PHTHALATE	84-66-2	1500	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
DIMETHYL PHTHALATE	131-11-3	---	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
DI-N-BUTYL PHTHALATE	84-74-2	90	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
DI-N-OCTYL PHTHALATE	117-84-0	20	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
HEXACHLOROBENZENE	118-74-1	0.0098	1	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
HEXACHLOROETHANE	67-72-1	0.33	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
ISOPHORONE	78-59-1	78	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				TS-UP-1						TS-UP-2			PZ-1		PZ-2	
				BLUE BEACH						BLUE BEACH			BLUE BEACH		BLUE BEACH	
				TS-UP-1-MW1-1316	TS-UP-1-MW2-1821	TS-UP-1-MW4-2427	TS-UP-1-MW5-3033	TS-UP-1-MW6-3940	S-UP-1-MW6-3940DU	TS-UP-2-MW1-1316	TS-UP-2-MW2-1821	TS-UP-2-MW3-2225	PZ-1-CI19	PZ-1-CI19-F	PZ-2-CI19	PZ-2-CI19-F
				23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	24-Jul-14	24-Jul-14	23-Jul-14	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19
								DUPLICATE	DUPLICATE							
ANALYTE	**CAS**	**RSL**	**MCL**													
SVOC (µg/L)																
NITROBENZENE	98-95-3	0.14	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
N-NITROSODIMETHYLAMINE	62-75-9	0.00011	---	---	---	---	---	---	---	---	---	---	7.1UJ	---	7.1UJ	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	0.011	---	---	---	---	---	---	---	---	---	---	7.1U	---	7.1U	---
N-NITROSODIPHENYLAMINE	86-30-6	12	---	---	---	---	---	---	---	---	---	---	7.1UJ	---	7.1UJ	---
PENTACHLOROPHENOL	87-86-5	0.041	1	---	---	---	---	---	---	---	---	---	18U	---	18U	---
PHENOL	108-95-2	580	---	---	---	---	---	---	---	---	---	---	7.1UJ	---	7.1UJ	---
PAHs (µg/L)																
1-METHYLNAPHTHALENE	90-12-0	1.1	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
2-METHYLNAPHTHALENE	91-57-6	3.6	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
ACENAPHTHENE	83-32-9	53	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
ACENAPHTHYLENE	208-96-8	---	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
ANTHRACENE	120-12-7	180	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
BENZO(A)ANTHRACENE	56-55-3	0.03	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
BENZO(A)PYRENE	50-32-8	0.025	0.2	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
BENZO(B)FLUORANTHENE	205-99-2	0.25	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
BENZO(K)FLUORANTHENE	207-08-9	2.5	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
CHRYSENE	218-01-9	25	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
FLUORANTHENE	206-44-0	80	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
FLUORENE	86-73-7	29	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
NAPHTHALENE	91-20-3	0.17	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
PHENANTHRENE	85-01-8	---	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
PYRENE	129-00-0	12	---	---	---	---	---	---	---	---	---	---	0.095U	---	0.095U	---
PCBs (µg/L)																
AROCLOR 1016	12674-11-2	0.14	---	---	---	---	---	---	---	---	---	---	0.24UJ	---	0.24UJ	---
AROCLOR 1221	11104-28-2	0.0047	---	---	---	---	---	---	---	---	---	---	0.24UJ	---	0.24UJ	---
AROCLOR 1232	11141-16-5	0.0047	---	---	---	---	---	---	---	---	---	---	0.24UJ	---	0.24UJ	---
AROCLOR 1242	53469-21-9	0.0078	---	---	---	---	---	---	---	---	---	---	0.24UJ	---	0.24UJ	---
AROCLOR 1248	12672-29-6	0.0078	---	---	---	---	---	---	---	---	---	---	0.24UJ	---	0.24UJ	---
AROCLOR 1254	11097-69-1	0.0078	---	---	---	---	---	---	---	---	---	---	0.24UJ	---	0.24UJ	---
AROCLOR 1260	11096-82-5	0.0078	---	---	---	---	---	---	---	---	---	---	0.24UJ	---	0.24UJ	---
TOTAL PCBs		0.044	0.5	---	---	---	---	---	---	---	---	---	1.7UJ	---	1.7UJ	---
METALS TOTAL (µg/L)																
ALUMINUM	7429-90-5	2000		---	---	---	---	---	---	---	---	---	100U	---	100U	---
ANTIMONY	7440-36-0	0.78	6	---	---	---	---	---	---	---	---	---	0.50U	---	1.0U	---
ARSENIC	7440-38-2	0.052	10	1.0U	1.0U	**0.6J**	---	**6.4J**	**5.9**	1.0U	**0.7J**	1.0U	4.0U	---	**4.8J**	---
BARIUM	7440-39-3	380	2000	**18.6J**	**17.5J**	**27.3J**	---	**922J**	**908**	**17.2J**	**24.1J**	**25.4J**	**58.3**	---	**57**	---
BERYLLIUM	7440-41-7	2.5	4	---	---	---	---	---	---	---	---	---	1.0U	---	1.0U	---
CADMIUM	7440-43-9	0.92	5	**0.05J**	**0.05J**	**0.17J**	---	**4.24J**	**4.27**	**0.18**	**0.07J**	**0.09J**	1.0U	---	0.20U	---
CALCIUM	7440-70-2			---	---	---	---	---	---	---	---	---	**203000**	---	**277000**	---
CHROMIUM	7440-47-3	2200	100	**3.0J**	**3.2J**	**26.2J**	---	**606J**	**637**	3.0U	**39.7**	**19.4J**	5.0U	---	5.0U	---
COBALT	7440-48-4	0.6		---	---	---	---	---	---	---	---	---	1.0U	---	1.0U	---
COPPER	7440-50-8	80	1300	---	---	---	---	---	---	---	---	---	3.0U	---	3.0U	---
IRON	7439-89-6	1400		---	---	---	---	---	---	---	---	---	**12400**	---	**90J**	---
LEAD	7439-92-1	15	15	**0.7J**	1.0UJ	**4.2J**	---	**304J**	**305**	**0.70J**	**2.2J**	1.0UJ	**0.16J**	---	0.50U	---
MAGNESIUM	7439-95-4			---	---	---	---	---	---	---	---	---	**374000**	---	**857000**	---
MANGANESE	7439-96-5	43		---	---	---	---	---	---	---	---	---	**1080**	---	**54.8**	---
MERCURY	7439-97-6	0.063	2	0.2U	0.2U	0.2U	---	0.2U	0.2U	0.2U	0.2U	0.2U	0.1U	---	0.1U	---
NICKEL	7440-02-0	39		---	---	---	---	---	---	---	---	---	2.0U	---	2.0U	---
POTASSIUM	7440-09-7			---	---	---	---	---	---	---	---	---	**122000**	---	**254000**	---
SELENIUM	7782-49-2	10	50	2.0U	2.0U	2.0U	---	2.0U	2.0U	2.0U	2.0U	2.0U	3.0U	---	3.0U	---
SILVER	7440-22-4	9.4		0.1UJ	0.1UJ	0.1UJ	---	0.1UJ	0.1U	0.1U	0.1U	0.1UJ	0.4U	---	1.0U	---
SODIUM	7440-23-5			---	---	---	---	---	---	---	---	---	**3360000**	---	**7070000**	---
THALLIUM	7440-28-0	0.02	2	---	---	---	---	---	---	---	---	---	0.4U	---	0.4U	---
VANADIUM	7440-62-2	8.6		---	---	---	---	---	---	---	---	---	5.0U	---	**6.38**	---
ZINC	7440-66-6	600		---	---	---	---	---	---	---	---	---	**29**	---	**5.8J**	---

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				TS-UP-1						TS-UP-2			PZ-1		PZ-2	
				BLUE BEACH						BLUE BEACH			BLUE BEACH		BLUE BEACH	
				TS-UP-1-MW1-1316	TS-UP-1-MW2-1821	TS-UP-1-MW4-2427	TS-UP-1-MW5-3033	TS-UP-1-MW6-3940	S-UP-1-MW6-3940DU	TS-UP-2-MW1-1316	TS-UP-2-MW2-1821	TS-UP-2-MW3-2225	PZ-1-CI19	PZ-1-CI19-F	PZ-2-CI19	PZ-2-CI19-F
				23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	23-Jul-14	24-Jul-14	24-Jul-14	23-Jul-14	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19
								DUPLICATE	DUPLICATE							
ANALYTE	**CAS**	**RSL**	**MCL**													
METALS DISSOLVED (µg/L)																
ALUMINUM, DISSOLVED	7429-90-5	2000		---	---	---	---	---	---	---	---	---	---	**18J**	---	**11J**
ANTIMONY, DISSOLVED	7440-36-0	0.78	6	---	---	---	---	---	---	---	---	---	---	0.5U	---	0.5U
ARSENIC, DISSOLVED	7440-38-2	0.052	10	---	---	---	---	---	---	---	---	---	---	4.0U	---	**4.4J**
BARIUM, DISSOLVED	7440-39-3	380	2000	---	---	---	---	---	---	---	---	---	---	**60.6**	---	**54.8**
BERYLLIUM, DISSOLVED	7440-41-7	2.5	4	---	---	---	---	---	---	---	---	---	---	0.2U	---	**0.26J**
CADMIUM, DISSOLVED	7440-43-9	0.92	5	---	---	---	---	---	---	---	---	---	---	0.2U	---	0.2U
CALCIUM, DISSOLVED	7440-70-2			---	---	---	---	---	---	---	---	---	---	**209000**	---	**271000**
CHROMIUM, DISSOLVED	7440-47-3	2200	100	---	---	---	---	---	---	---	---	---	---	5.0U	---	5.0U
COBALT, DISSOLVED	7440-48-4	0.6		---	---	---	---	---	---	---	---	---	---	**0.684J**	---	**0.066J**
COPPER, DISSOLVED	7440-50-8	80	1300	---	---	---	---	---	---	---	---	---	---	2.0U	---	2.0U
IRON, DISSOLVED	7439-89-6	1400		---	---	---	---	---	---	---	---	---	---	**12700**	---	60U
LEAD, DISSOLVED	7439-92-1	15	15	---	---	---	---	---	---	---	---	---	---	0.5U	---	0.5U
MAGNESIUM, DISSOLVED	7439-95-4			---	---	---	---	---	---	---	---	---	---	**386000**	---	**814000**
MANGANESE, DISSOLVED	7439-96-5	43		---	---	---	---	---	---	---	---	---	---	**1160**	---	**54.5**
MERCURY, DISSOLVED	7439-97-6	0.063	2	---	---	---	---	---	---	---	---	---	---	0.1U	---	0.1U
NICKEL, DISSOLVED	7440-02-0	39		---	---	---	---	---	---	---	---	---	---	2.0U	---	2.0U
POTASSIUM, DISSOLVED	7440-09-7			---	---	---	---	---	---	---	---	---	---	**131000**	---	**249000**
SELENIUM, DISSOLVED	7782-49-2	10	50	---	---	---	---	---	---	---	---	---	---	3.0U	---	3.0U
SILVER, DISSOLVED	7440-22-4	9.4		---	---	---	---	---	---	---	---	---	---	0.4U	---	**0.071J**
SODIUM, DISSOLVED	7440-23-5			---	---	---	---	---	---	---	---	---	---	**3710000**	---	**6830000**
THALLIUM, DISSOLVED	7440-28-0	0.02	2	---	---	---	---	---	---	---	---	---	---	0.4U	---	0.4U
VANADIUM, DISSOLVED	7440-62-2	8.6		---	---	---	---	---	---	---	---	---	---	4.0U	---	**5.93**
ZINC, DISSOLVED	7440-66-6	600		---	---	---	---	---	---	---	---	---	---	**7.6J**	---	8.0U

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water
and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds RSL or MCL

Table 5-11
Summary of On-Project and Kiefer Park Groundwater Analytical Data
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				WP-5		WP-6		W94-6		W98-1	
				BLUE BEACH		BLUE BEACH		KIEFER PARK		BLUE BEACH	
				WP-5-CI19	WP-5-CI19-F	WP-6-CI19	WP-6-CI19-F	W94-6-CI19	W94-6-CI19-F	W98-1-CI19	W98-1-CI19-F
				29-Oct-19	29-Oct-19	28-Oct-19	28-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**								
VOCs (µg/L)											
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,1,1-TRICHLOROETHANE	71-55-6	800	200	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.076	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,1,2-TRICHLOROETHANE	79-00-5	0.041	5	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,1-DICHLOROETHANE	75-34-3	2.8	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,1-DICHLOROETHENE	75-35-4	28	7	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,1-DICHLOROPROPENE	563-58-6	---	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,2,3-TRICHLOROBENZENE	87-61-6	0.7	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	7.2U	---	7.1U	---	7.1UJ	---	0.5U	---
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	---	**45**	---	0.5UJ	---	**87**	---	0.5U	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	0.2	0.75U	---	0.75UJ	---	0.75U	---	0.75U	---
1,2-DIBROMOETHANE	106-93-4	---	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	0.5U	---	0.5UJ	---	0.5U	---	7.1U	---
1,2-DICHLOROETHANE	107-06-2	0.17	5	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,2-DICHLOROPROPANE	78-87-5	0.82	5	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---	**1.9**	---	0.5UJ	---	0.5U	---	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	7.2U	---	7.1U	---	0.5U	---	0.5U	---
1,3-DICHLOROPROPANE	142-28-9	37	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	7.2U	---	0.5UJ	---	7.1UJ	---	7.1U	---
2,2-DICHLOROPROPANE	594-20-7	---	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
2-BUTANONE (MEK)	78-93-3	560	---	2.5U	---	2.5UJ	---	2.5U	---	2.5U	---
2-CHLOROTOLUENE	95-49-8	24	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
2-HEXANONE	591-78-6	3.8	---	2.5U	---	2.5UJ	---	2.5U	---	2.5U	---
4-CHLOROTOLUENE	106-43-4	25	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
4-ISOPROPYLTOLUENE	99-87-6	---	---	0.5U	---	0.5UJ	---	**8.9**	---	0.5U	---
4-METHYL-2-PENTANONE	108-10-1	---	---	2.5U	---	2.5UJ	---	2.5U	---	2.5U	---
ACETONE	67-64-1	1400	---	2.5U	---	5.0UJ	---	7.4U	---	2.5U	---
BENZENE	71-43-2	0.46	5	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
BROMOBENZENE	108-86-1	6.2	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
BROMOMETHANE	74-83-9	0.75	---	1.0U	---	1.0UJ	---	1.0U	---	1.0U	---
BROMOCHLOROMETHANE	74-97-5	8.3	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
BROMODICHLOROMETHANE	75-27-4	0.13	80	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
BROMOFORM	75-25-2	3.3	80	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
CARBON DISULFIDE	75-15-0	81	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
CARBON TETRACHLORIDE	56-23-5	0.46	5	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
CHLOROBENZENE	108-90-7	7.8	100	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
CHLOROETHANE	75-00-3	2100	---	1.0U	---	1.0UJ	---	1.0U	---	1.0U	---
CHLOROFORM	67-66-3	0.22	80	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
CHLOROMETHANE	74-87-3	19	---	1.0U	---	1.0UJ	---	1.0U	---	1.0U	---
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	70	0.5U	---	0.5UJ	---	0.5U	---	**5.9**	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
DIBROMOCHLOROMETHANE	124-48-1	0.87	80	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
DIBROMOMETHANE	74-95-3	0.83	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
DICHLORODIFLUOROMETHANE	75-71-8	20	---	1.0U	---	1.0UJ	---	1.0U	---	1.0U	---
DIISOPROPYL ETHER	108-20-3	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	1.5	700	0.5U	---	0.5UJ	---	**14**	---	0.5U	---
HEXACHLOROBUTADIENE	87-68-3	0.14	---	0.75U	---	0.75UJ	---	0.75U	---	0.75U	---
ISOPROPYLBENZENE	98-82-8	---	---	**6.2**	---	0.5UJ	---	**17**	---	0.5U	---
METHYL BROMIDE	74-83-9	---	---	1.0U	---	1.0UJ	---	1.0U	---	1.0U	---
METHYL TERT-BUTYL ETHER	1634-04-4	---	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
METHYLENE CHLORIDE	75-09-2	11	5	2.5U	---	2.5UJ	---	2.5U	---	2.5U	---
NAPHTHALENE	91-20-3	0.17	---	**34**	---	0.095U	---	**170**	---	0.094U	---
N-BUTYL BENZENE	104-51-8	---	---	**1.8**	---	0.5UJ	---	**6.2**	---	0.5U	---
N-PROPYL BENZENE	103-65-1	---	---	**6.0**	---	0.5UJ	---	**22**	---	0.5U	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	0.5U	---	0.5UJ	---	**8.9**	---	0.5U	---
SEC-BUTYL BENZENE	135-98-8	---	---	**4.2**	---	0.5UJ	---	**7.9**	---	0.5U	---
STYRENE	100-42-5	120	100	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---

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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				WP-5		WP-6		W94-6		W98-1	
				BLUE BEACH		BLUE BEACH		KIEFER PARK		BLUE BEACH	
				WP-5-CI19	WP-5-CI19-F	WP-6-CI19	WP-6-CI19-F	W94-6-CI19	W94-6-CI19-F	W98-1-CI19	W98-1-CI19-F
				29-Oct-19	29-Oct-19	28-Oct-19	28-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**								
VOCs (µg/L)											
TERT-BUTYLBENZENE	98-06-6	69	---	**2.4**	---	0.5UJ	---	**5**	---	0.5U	---
TETRACHLOROETHENE	127-18-4	4.1	5	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
TETRAHYDROFURAN	109-99-9	340	---	5.0U	---	5.0UJ	---	5.0U	---	5.0U	---
TOLUENE	108-88-3	110	1000	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
TRANS-1,2-DICHLOROETHENE	156-60-5	36	100	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
TRICHLOROETHYLENE	79-01-6	0.28	5	0.5U	---	0.5UJ	---	0.5U	---	**13**	---
TRICHLOROFLUOROMETHANE	75-69-4	520	---	1.0U	---	1.0UJ	---	1.0U	---	1.0U	---
VINYL CHLORIDE	75-01-4	0.019	2	1.0U	---	1.0UJ	---	1.0U	---	1.0U	---
XYLENE O	95-47-6	---	---	0.5U	---	0.5UJ	---	**0.26J**	---	0.5U	---
XYLENE P,M	179601-23-1	---	---	1.0U	---	1.0UJ	---	1.0U	---	1.0U	---
TOTAL XYLENES	1330-20-7	19	10000	0.5U	---	0.5UJ	---	**0.26J**	---	0.5U	---
SVOC (µg/L)											
1,2,4-TRICHLOROBENZENE	120-82-1	0.4	70	7.2U	---	7.1U	---	7.1UJ	---	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	30	600	0.5U	---	0.5UJ	---	0.5U	---	7.1U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	7.2U	---	7.1U	---	0.5U	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	0.48	75	7.2U	---	0.5UJ	---	7.1UJ	---	7.1U	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	71	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
2,4,5-TRICHLOROPHENOL	95-95-4	120	---	18U	---	18U	---	18UJ	---	18U	---
2,4,6-TRICHLOROPHENOL	88-06-2	1.2	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
2,4-DICHLOROPHENOL	120-83-2	4.6	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
2,4-DIMETHYLPHENOL	105-67-9	36	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
2,4-DINITROPHENOL	51-28-5	3.9	---	18U	---	18U	---	18UJ	---	18U	---
2,4-DINITROTOLUENE	121-14-2	0.24	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
2,6-DINITROTOLUENE	606-20-2	0.049	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
trans-1,3-Dichloropropene	10061-02-6	---	---	0.5U	---	0.5UJ	---	0.5U	---	0.5U	---
2-CHLORONAPHTHALENE	91-58-7	75	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
2-CHLOROPHENOL	95-57-8	9.1	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	93	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
2-NITROANILINE	88-74-4	19	---	18U	---	18U	---	18UJ	---	18U	---
2-NITROPHENOL	88-75-5	---	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
3,3'-DICHLOROBENZIDINE	91-94-1	0.13	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
3-NITROANILINE	99-09-2	---	---	18U	---	18U	---	18UJ	---	18U	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	0.15	---	18U	---	18U	---	18UJ	---	18U	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
4-CHLORO-3-METHYLPHENOL	59-50-7	140	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
4-CHLOROANILINE	106-47-8	0.37	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
4-NITROANILINE	100-01-6	3.8	---	18U	---	18U	---	18UJ	---	18U	---
4-NITROPHENOL	100-02-7	---	---	18UJ	---	18UJ	---	18UJ	---	18UJ	---
BENZOIC ACID	65-85-0	7500	---	18UJ	---	18UJ	---	18UJ	---	18UJ	---
BENZYL ALCOHOL	100-51-6	200	---	14U	---	14U	---	14UJ	---	14UJ	---
BENZYL BUTYL PHTHALATE	85-68-7	16	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	5.9	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	0.014	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	5.6	6	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
CARBAZOLE	86-74-8	---	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
CRESOLS, M- & P-		---	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
DIBENZOFURAN	132-64-9	0.79	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
DIETHYL PHTHALATE	84-66-2	1500	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
DIMETHYL PHTHALATE	131-11-3	---	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
DI-N-BUTYL PHTHALATE	84-74-2	90	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
DI-N-OCTYL PHTHALATE	117-84-0	20	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
HEXACHLOROBENZENE	118-74-1	0.0098	1	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
HEXACHLOROETHANE	67-72-1	0.33	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
ISOPHORONE	78-59-1	78	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---

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Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				WP-5		WP-6		W94-6		W98-1	
				BLUE BEACH		BLUE BEACH		KIEFER PARK		BLUE BEACH	
				WP-5-CI19	WP-5-CI19-F	WP-6-CI19	WP-6-CI19-F	W94-6-CI19	W94-6-CI19-F	W98-1-CI19	W98-1-CI19-F
				29-Oct-19	29-Oct-19	28-Oct-19	28-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**								
SVOC (µg/L)											
NITROBENZENE	98-95-3	0.14	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
N-NITROSODIMETHYLAMINE	62-75-9	0.00011	---	7.2U	---	7.1U	---	7.1UJ	---	7.1UJ	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	0.011	---	7.2U	---	7.1U	---	7.1UJ	---	7.1U	---
N-NITROSODIPHENYLAMINE	86-30-6	12	---	7.2U	---	7.1U	---	7.1UJ	---	7.1UJ	---
PENTACHLOROPHENOL	87-86-5	0.041	1	18U	---	18U	---	18UJ	---	18U	---
PHENOL	108-95-2	580	---	7.2UJ	---	7.1UJ	---	7.1UJ	---	7.1UJ	---
PAHs (µg/L)											
1-METHYLNAPHTHALENE	90-12-0	1.1	---	**18**	---	0.095U	---	**56**	---	0.094U	---
2-METHYLNAPHTHALENE	91-57-6	3.6	---	**14**	---	0.095U	---	**66**	---	0.094U	---
ACENAPHTHENE	83-32-9	53	---	**0.12J**	---	0.095U	---	0.095UJ	---	0.094U	---
ACENAPHTHYLENE	208-96-8	---	---	0.096U	---	0.095U	---	0.095UJ	---	0.094U	---
ANTHRACENE	120-12-7	180	---	0.096U	---	0.095U	---	0.095UJ	---	0.094U	---
BENZO(A)ANTHRACENE	56-55-3	0.03	---	**0.058J**	---	0.095U	---	0.095UJ	---	0.094U	---
BENZO(A)PYRENE	50-32-8	0.025	0.2	**0.09J**	---	0.095U	---	0.095UJ	---	0.094U	---
BENZO(B)FLUORANTHENE	205-99-2	0.25	---	**0.09J**	---	0.095U	---	0.095UJ	---	0.094U	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---	**0.079J**	---	0.095U	---	0.095UJ	---	0.094U	---
BENZO(K)FLUORANTHENE	207-08-9	2.5	---	0.096U	---	0.095U	---	0.095UJ	---	0.094U	---
CHRYSENE	218-01-9	25	---	0.19U	---	0.095U	---	0.095UJ	---	0.094U	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---	0.096U	---	0.095U	---	0.095UJ	---	0.094U	---
FLUORANTHENE	206-44-0	80	---	**0.089J**	---	0.095U	---	0.095UJ	---	0.094U	---
FLUORENE	86-73-7	29	---	**0.16J**	---	0.095U	---	**0.07J**	---	0.094U	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---	0.096U	---	0.095U	---	0.095UJ	---	0.094U	---
NAPHTHALENE	91-20-3	0.17	---	**34**	---	0.095U	---	**170**	---	0.094U	---
PHENANTHRENE	85-01-8	---	---	**0.082J**	---	0.095U	---	0.095UJ	---	0.094U	---
PYRENE	129-00-0	12	---	0.096U	---	0.095U	---	0.095UJ	---	0.094U	---
PCBs (µg/L)											
AROCLOR 1016	12674-11-2	0.14	---	0.23UJ	---	0.24UJ	---	0.25UJ	---	0.23UJ	---
AROCLOR 1221	11104-28-2	0.0047	---	0.23UJ	---	0.24UJ	---	0.25UJ	---	0.23UJ	---
AROCLOR 1232	11141-16-5	0.0047	---	0.23UJ	---	0.24UJ	---	0.25UJ	---	0.23UJ	---
AROCLOR 1242	53469-21-9	0.0078	---	0.23UJ	---	0.24UJ	---	0.25UJ	---	0.23UJ	---
AROCLOR 1248	12672-29-6	0.0078	---	0.23UJ	---	0.24UJ	---	0.25UJ	---	0.23UJ	---
AROCLOR 1254	11097-69-1	0.0078	---	0.23UJ	---	0.24UJ	---	0.25UJ	---	0.23UJ	---
AROCLOR 1260	11096-82-5	0.0078	---	0.23UJ	---	0.24UJ	---	0.25UJ	---	0.23UJ	---
TOTAL PCBs		0.044	0.5	1.6UJ	---	1.7UJ	---	1.7UJ	---	1.6UJ	---
METALS TOTAL (µg/L)											
ALUMINUM	7429-90-5	2000		100U	---	**320**	---	100U	---	100U	---
ANTIMONY	7440-36-0	0.78	6	0.50U	---	0.50U	---	1.0U	---	0.50U	---
ARSENIC	7440-38-2	0.052	10	**2.4J**	---	4.0U	---	**3.9J**	---	4.0U	---
BARIUM	7440-39-3	380	2000	**7.36**	---	**18.1**	---	**81.8**	---	**23.6**	---
BERYLLIUM	7440-41-7	2.5	4	0.2U	---	1.0U	---	**0.082J**	---	1.0U	---
CADMIUM	7440-43-9	0.92	5	**0.037J**	---	1.0U	---	**0.096J**	---	1.0U	---
CALCIUM	7440-70-2			**9210**	---	**335**	---	**98800**	---	**61100**	---
CHROMIUM	7440-47-3	2200	100	5.0U	---	5.0U	---	5.0U	---	5.0U	---
COBALT	7440-48-4	0.6		**1.42**	---	**6.84**	---	**0.36J**	---	**5.09**	---
COPPER	7440-50-8	80	1300	3.0U	---	**6.49**	---	**4.01**	---	2.0U	---
IRON	7439-89-6	1400		**32700**	---	**1470**	---	**56900**	---	**16900**	---
LEAD	7439-92-1	15	15	**0.59J**	---	1.0U	---	1.0U	---	0.50U	---
MAGNESIUM	7439-95-4			**1280**	---	**605**	---	**6160**	---	**127000**	---
MANGANESE	7439-96-5	43		**1350**	---	**81.6**	---	**1510**	---	**772**	---
MERCURY	7439-97-6	0.063	2	0.1U	---	0.1U	---	0.1U	---	0.1U	---
NICKEL	7440-02-0	39		2.0U	---	**4.26**	---	**0.65J**	---	**4.64**	---
POTASSIUM	7440-09-7			**1160**	---	**1990**	---	**7970**	---	**53700**	---
SELENIUM	7782-49-2	10	50	3.0U	---	3.0U	---	5.0U	---	3.0U	---
SILVER	7440-22-4	9.4		0.4U	---	0.4U	---	0.4U	---	0.4U	---
SODIUM	7440-23-5			**8050**	---	**7870**	---	**185000**	---	**1510000**	---
THALLIUM	7440-28-0	0.02	2	0.4U	---	0.4U	---	0.4U	---	0.4U	---
VANADIUM	7440-62-2	8.6		4.0U	---	4.0U	---	5.0U	---	4.0U	---
ZINC	7440-66-6	600		**18**	---	**140**	---	**4.3J**	---	**21**	---

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North Kingstown, Rhode Island

				WP-5		WP-6		W94-6		W98-1	
				BLUE BEACH		BLUE BEACH		KIEFER PARK		BLUE BEACH	
				WP-5-CI19	WP-5-CI19-F	WP-6-CI19	WP-6-CI19-F	W94-6-CI19	W94-6-CI19-F	W98-1-CI19	W98-1-CI19-F
				29-Oct-19	29-Oct-19	28-Oct-19	28-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19
ANALYTE	**CAS**	**RSL**	**MCL**								
METALS DISSOLVED (µg/L)											
ALUMINUM, DISSOLVED	7429-90-5	2000		---	100U	---	**386**	---	100U	---	40U
ANTIMONY, DISSOLVED	7440-36-0	0.78	6	---	**0.19J**	---	0.5U	---	1.0U	---	0.5U
ARSENIC, DISSOLVED	7440-38-2	0.052	10	---	**2.4J**	---	4.0U	---	**3.9J**	---	4.0U
BARIUM, DISSOLVED	7440-39-3	380	2000	---	**8.22**	---	**17.4**	---	**89.3**	---	**48.6**
BERYLLIUM, DISSOLVED	7440-41-7	2.5	4	---	0.2U	---	**0.527J**	---	1.0U	---	**0.15J**
CADMIUM, DISSOLVED	7440-43-9	0.92	5	---	0.2U	---	**0.425J**	---	**0.037J**	---	0.2U
CALCIUM, DISSOLVED	7440-70-2			---	**9140**	---	**264**	---	**109000**	---	**150000**
CHROMIUM, DISSOLVED	7440-47-3	2200	100	---	5.0U	---	5.0U	---	5.0U	---	5.0U
COBALT, DISSOLVED	7440-48-4	0.6		---	**1.56**	---	**5.8**	---	1.0U	---	**10.2**
COPPER, DISSOLVED	7440-50-8	80	1300	---	3.0U	---	**5.27**	---	3.0U	---	3.0U
IRON, DISSOLVED	7439-89-6	1400		---	**32300**	---	**1740**	---	**63800**	---	**14500**
LEAD, DISSOLVED	7439-92-1	15	15	---	**0.46J**	---	**0.48J**	---	1.0U	---	0.5U
MAGNESIUM, DISSOLVED	7439-95-4			---	**1260**	---	**574**	---	**6980**	---	**322000**
MANGANESE, DISSOLVED	7439-96-5	43		---	**1350**	---	**75.8**	---	**1690**	---	**1630**
MERCURY, DISSOLVED	7439-97-6	0.063	2	---	0.1U	---	0.1U	---	0.2U	---	0.1U
NICKEL, DISSOLVED	7440-02-0	39		---	2.0U	---	**4.14**	---	**0.56J**	---	**9.74**
POTASSIUM, DISSOLVED	7440-09-7			---	**1080**	---	**1790**	---	**8580**	---	**96600**
SELENIUM, DISSOLVED	7782-49-2	10	50	---	3.0U	---	3.0U	---	5.0U	---	3.0U
SILVER, DISSOLVED	7440-22-4	9.4		---	0.4U	---	0.4U	---	0.4U	---	0.4U
SODIUM, DISSOLVED	7440-23-5			---	**8150**	---	**7210**	---	**203000**	---	**2670000**
THALLIUM, DISSOLVED	7440-28-0	0.02	2	---	0.4U	---	0.4U	---	0.4U	---	**0.082J**
VANADIUM, DISSOLVED	7440-62-2	8.6		---	4.0U	---	4.0U	---	5.0U	---	4.0U
ZINC, DISSOLVED	7440-66-6	600		---	**19**	---	**135**	---	**4.8J**	---	**22**

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water
and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection
(LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds RSL or MCL

Table 5-12
Summary of Groundwater Analytical Data - Off-Project Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	CDW-1		CDW-2		CDW-3		CDW-4				COE-1	
			SAMPLE ID	CDW-1-CI19	CDW-1-CI19-F	CDW-2-CI19	CDW-2-CI19-F	CDW-3-CI19	CDW-3-CI19-F	CDW-4-CI19	CDW-4-CI19-DUP	CDW-4-CI19-F	CDW-4-CI19-F-DUP	COE-1-CI19	COE-1-CI19-F
			SAMPLE DATE	23-Oct-19	23-Oct-19	24-Oct-19	24-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19
			QC IDENTIFIER												
ANALYTE	**CAS**	**MCL**	**RIDEM GA**												
VOCs (µg/L)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1,1-TRICHLOROETHANE	71-55-6	200	200	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1,2-TRICHLOROETHANE	79-00-5	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1-DICHLOROETHANE	75-34-3	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1-DICHLOROETHENE	75-35-4	7	7	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,1-DICHLOROPROPENE	563-58-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,2,3-TRICHLOROBENZENE	87-61-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,2,3-TRICHLOROPROPANE	96-18-4	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,2,4-TRICHLOROBENZENE	120-82-1	70	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
1,2,4-TRIMETHYLBENZENE	95-63-6	---	---	0.5U	---	0.5U	---	**0.26J**	---	**31**	**31**	---	---	0.5U	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.2	---	0.75U	---	0.75U	---	0.75U	---	0.75U	0.75U	---	---	0.75U	---
1,2-DIBROMOETHANE	106-93-4	---	0.05	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	600	---	7.1U	---	0.5U	---	0.5U	---	6.9U	0.5U	---	---	7.5U	---
1,2-DICHLOROETHANE	107-06-2	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,2-DICHLOROPROPANE	78-87-5	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,3,5-TRIMETHYLBENZENE	108-67-8	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	7.1UJ	---	0.5U	---	7.0U	---	6.9U	0.5U	---	---	0.5U	---
1,3-DICHLOROPROPANE	142-28-9	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	75	---	0.5U	---	0.5U	---	0.5U	---	6.9U	7.1UJ	---	---	0.5U	---
2,2-DICHLOROPROPANE	594-20-7	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
2-BUTANONE (MEK)	78-93-3	---	---	2.5U	---	2.5U	---	2.5U	---	2.5U	2.5U	---	---	**3.8J**	---
2-CHLOROTOLUENE	95-49-8	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
2-HEXANONE	591-78-6	---	---	2.5U	---	2.5U	---	2.5U	---	2.5U	2.5U	---	---	2.5U	---
4-CHLOROTOLUENE	106-43-4	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
4-ISOPROPYLTOLUENE	99-87-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
4-METHYL-2-PENTANONE	108-10-1	---	---	2.5U	---	2.5U	---	2.5U	---	2.5U	2.5U	---	---	2.5U	---
ACETONE	67-64-1	---	---	2.5U	---	2.5U	---	5.0U	---	5.0U	2.5U	---	---	**6.2**	---
BENZENE	71-43-2	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
BROMOBENZENE	108-86-1	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
BROMOMETHANE	74-83-9	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
BROMOCHLOROMETHANE	74-97-5	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
BROMODICHLOROMETHANE	75-27-4	80	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
BROMOFORM	75-25-2	80	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
CARBON DISULFIDE	75-15-0	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	**0.34J**	---
CARBON TETRACHLORIDE	56-23-5	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
CHLOROBENZENE	108-90-7	100	100	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
CHLOROETHANE	75-00-3	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
CHLOROFORM	67-66-3	80	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
CHLOROMETHANE	74-87-3	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
CIS-1,2-DICHLOROETHENE	156-59-2	70	70	0.5U	---	0.5U	---	**0.51J**	---	0.5U	0.5U	---	---	0.5U	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
DIBROMOCHLOROMETHANE	124-48-1	80	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
DIBROMOMETHANE	74-95-3	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
DICHLORODIFLUOROMETHANE	75-71-8	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
DIISOPROPYL ETHER	108-20-3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	700	700	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
HEXACHLOROBUTADIENE	87-68-3	---	---	0.75U	---	0.75U	---	0.75U	---	0.75U	0.75U	---	---	0.75U	---
ISOPROPYLBENZENE	98-82-8	---	---	0.5U	---	0.5U	---	0.5U	---	**4.4**	**4.3**	---	---	0.5U	---
METHYL BROMIDE	74-83-9	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
METHYL TERT-BUTYL ETHER	1634-04-4	---	40	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
METHYLENE CHLORIDE	75-09-2	5	5	2.5U	---	2.5U	---	2.5U	---	2.5U	2.5U	---	---	2.5U	---
NAPHTHALENE	91-20-3	---	20	0.094U	---	0.097U	---	0.093U	---	**26J**	**17J**	---	---	**0.08J**	---
N-BUTYL BENZENE	104-51-8	---	---	0.5U	---	0.5U	---	0.5U	---	**1.9**	**1.9**	---	---	0.5U	---
N-PROPYL BENZENE	103-65-1	---	---	0.5U	---	0.5U	---	0.5U	---	**4.5**	**4.4**	---	---	0.5U	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
SEC-BUTYL BENZENE	135-98-8	---	---	0.5U	---	0.5U	---	0.5U	---	**3.4**	**3.5**	---	---	0.5U	---
STYRENE	100-42-5	100	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---

Table 5-12
Summary of Groundwater Analytical Data - Off-Project Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	CDW-1		CDW-2		CDW-3		CDW-4				COE-1	
			SAMPLE ID	CDW-1-CI19	CDW-1-CI19-F	CDW-2-CI19	CDW-2-CI19-F	CDW-3-CI19	CDW-3-CI19-F	CDW-4-CI19	CDW-4-CI19-DUP	CDW-4-CI19-F	CDW-4-CI19-F-DUP	COE-1-CI19	COE-1-CI19-F
			SAMPLE DATE	23-Oct-19	23-Oct-19	24-Oct-19	24-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19
			QC IDENTIFIER												
ANALYTE	**CAS**	**MCL**	**RIDEM GA**												
VOCs (µg/L)															
TERT-BUTYLBENZENE	98-06-6	---	---	0.5U	---	0.5U	---	0.5U	---	**1.8**	**1.9**	---	---	0.5U	---
TETRACHLOROETHENE	127-18-4	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
TETRAHYDROFURAN	109-99-9	---	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---	5.0U	---
TOLUENE	108-88-3	1000	1000	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
TRANS-1,2-DICHLOROETHENE	156-60-5	100	100	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
TRICHLOROETHYLENE	79-01-6	5	5	0.5U	---	**1.6**	---	**1.7**	---	0.5U	0.5U	---	---	0.5U	---
TRICHLOROFLUOROMETHANE	75-69-4	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
VINYL CHLORIDE	75-01-4	2	2	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
XYLENE O	95-47-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
XYLENE P,M	179601-23-1	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	1.0U	---	---	1.0U	---
TOTAL XYLENES	1330-20-7	10000	10000	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
SVOC (µg/L)															
1,2,4-TRICHLOROBENZENE	120-82-1	70	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
1,2-DICHLOROBENZENE	95-50-1	600	---	7.1U	---	0.5U	---	0.5U	---	6.9U	0.5U	---	---	7.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	7.1UJ	---	0.5U	---	7.0U	---	6.9U	0.5U	---	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	75	---	0.5U	---	0.5U	---	0.5U	---	6.9U	7.1UJ	---	---	0.5U	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
2,4,5-TRICHLOROPHENOL	95-95-4	---	---	18U	---	18U	---	---	---	17U	18UJ	---	---	19U	---
2,4,6-TRICHLOROPHENOL	88-06-2	---	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
2,4-DICHLOROPHENOL	120-83-2	---	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
2,4-DIMETHYLPHENOL	105-67-9	---	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
2,4-DINITROPHENOL	51-28-5	---	---	18U	---	18U	---	---	---	17U	18UJ	---	---	19U	---
2,4-DINITROTOLUENE	121-14-2	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
2,6-DINITROTOLUENE	606-20-2	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
trans-1,3-Dichloropropene	10061-02-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	0.5U	---	---	0.5U	---
2-CHLORONAPHTHALENE	91-58-7	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
2-CHLOROPHENOL	95-57-8	---	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	---	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
2-NITROANILINE	88-74-4	---	---	18U	---	18U	---	18U	---	17U	18UJ	---	---	19U	---
2-NITROPHENOL	88-75-5	---	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
3,3'-DICHLOROBENZIDINE	91-94-1	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
3-NITROANILINE	99-09-2	---	---	18U	---	18U	---	18U	---	17U	18UJ	---	---	19U	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	---	---	18U	---	18U	---	---	---	17U	18UJ	---	---	19U	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
4-CHLORO-3-METHYLPHENOL	59-50-7	---	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
4-CHLOROANILINE	106-47-8	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
4-NITROANILINE	100-01-6	---	---	18U	---	18U	---	18U	---	17U	18UJ	---	---	19U	---
4-NITROPHENOL	100-02-7	---	---	18UJ	---	18UJ	---	---	---	17UJ	18UJ	---	---	19UJ	---
BENZOIC ACID	65-85-0	---	---	18UJ	---	18UJ	---	---	---	17UJ	18UJ	---	---	19UJ	---
BENZYL ALCOHOL	100-51-6	---	---	14U	---	14U	---	14U	---	14U	14UJ	---	---	15UJ	---
BENZYL BUTYL PHTHALATE	85-68-7	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	6	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	**2J**	---
CARBAZOLE	86-74-8	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
CRESOLS, M- & P-		---	---	7.1U	---	7.3U	---	---	---	6.9U	7.1UJ	---	---	7.5U	---
DIBENZOFURAN	132-64-9	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
DIETHYL PHTHALATE	84-66-2	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
DIMETHYL PHTHALATE	131-11-3	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
DI-N-BUTYL PHTHALATE	84-74-2	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
DI-N-OCTYL PHTHALATE	117-84-0	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
HEXACHLOROBENZENE	118-74-1	1	1	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
HEXACHLOROETHANE	67-72-1	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
ISOPHORONE	78-59-1	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---

Table 5-12
Summary of Groundwater Analytical Data - Off-Project Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	CDW-1		CDW-2		CDW-3		CDW-4				COE-1	
			SAMPLE ID	CDW-1-CI19	CDW-1-CI19-F	CDW-2-CI19	CDW-2-CI19-F	CDW-3-CI19	CDW-3-CI19-F	CDW-4-CI19	CDW-4-CI19-DUP	CDW-4-CI19-F	CDW-4-CI19-F-DUP	COE-1-CI19	COE-1-CI19-F
			SAMPLE DATE	23-Oct-19	23-Oct-19	24-Oct-19	24-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19
			QC IDENTIFIER												
ANALYTE	**CAS**	**MCL**	**RIDEM GA**												
SVOC (µg/L)															
NITROBENZENE	98-95-3	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
N-NITROSODIMETHYLAMINE	62-75-9	---	---	7.1UJ	---	7.3UJ	---	7.0U	---	6.9U	7.1UJ	---	---	7.5UJ	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5U	---
N-NITROSODIPHENYLAMINE	86-30-6	---	---	7.1U	---	7.3U	---	7.0U	---	6.9U	7.1UJ	---	---	7.5UJ	---
PENTACHLOROPHENOL	87-86-5	1	---	18U	---	18U	---	---	---	17U	18UJ	---	---	19U	---
PHENOL	108-95-2	---	---	7.1UJ	---	7.3UJ	---	---	---	6.9UJ	7.1UJ	---	---	7.5UJ	---
PAHs (µg/L)															
1-METHYLNAPHTHALENE	90-12-0	---	---	0.094U	---	0.097U	---	0.093U	---	**20J**	**11J**	---	---	0.1U	---
2-METHYLNAPHTHALENE	91-57-6	---	---	0.094U	---	0.097U	---	0.093U	---	**21J**	**11J**	---	---	0.1U	---
ACENAPHTHENE	83-32-9	---	---	0.094U	---	0.097U	---	0.093U	---	**0.26J**	0.094UJ	---	---	0.1U	---
ACENAPHTHYLENE	208-96-8	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	0.1U	---
ANTHRACENE	120-12-7	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	0.1U	---
BENZO(A)ANTHRACENE	56-55-3	---	---	0.094UJ	---	0.097UJ	---	0.093U	---	0.092U	0.094U	---	---	**0.4**	---
BENZO(A)PYRENE	50-32-8	0.2	0.2	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.11J**	---
BENZO(B)FLUORANTHENE	205-99-2	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.35**	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.077J**	---
BENZO(K)FLUORANTHENE	207-08-9	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	0.1U	---
CHRYSENE	218-01-9	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.16J**	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.13J**	---
FLUORANTHENE	206-44-0	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.15J**	---
FLUORENE	86-73-7	---	---	0.094U	---	0.097U	---	0.093U	---	**0.29**	**0.18J**	---	---	0.1U	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.13J**	---
NAPHTHALENE	91-20-3	---	20	0.094U	---	0.097U	---	0.093U	---	**26J**	**17J**	---	---	**0.08J**	---
PHENANTHRENE	85-01-8	---	---	0.094U	---	0.097U	---	0.093U	---	**0.13J**	**0.069J**	---	---	**0.059J**	---
PYRENE	129-00-0	---	---	0.094U	---	0.097U	---	0.093U	---	0.092U	0.094U	---	---	**0.28**	---
PCBs (µg/L)					---		---		---						
AROCLOR 1016	12674-11-2	---	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
AROCLOR 1221	11104-28-2	---	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
AROCLOR 1232	11141-16-5	---	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
AROCLOR 1242	53469-21-9	---	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
AROCLOR 1248	12672-29-6	---	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
AROCLOR 1254	11097-69-1	---	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
AROCLOR 1260	11096-82-5	---	---	0.24UJ	---	0.24U	---	0.24U	---	0.24UJ	0.23U	---	---	0.3U	---
TOTAL PCBs		0.5	**0.5**	1.6UJ	---	1.7U	---	1.7U	---	1.7UJ	1.6U	---	---	2.1U	---
METALS TOTAL (µg/L)															
ALUMINUM	7429-90-5			**489**	---	100U	---	**35600**	---	100U	100 U	---	---	100U	---
ANTIMONY	7440-36-0	6	6	1.0U	---	1.0U	---	1.0U	---	1.0U	1.00 U	---	---	**2.17**	---
ARSENIC	7440-38-2	10	10	4.0U	---	4.0U	---	**6.2**	---	4.0U	4.00 U	---	---	**5.4**	---
BARIUM	7440-39-3	2000	2000	**16.9**	---	**10.6**	---	**128**	---	**24.8J**	**27.7 J**	---	---	**12.5**	---
BERYLLIUM	7440-41-7	4	4	**0.1J**	---	**0.07J**	---	**3.63**	---	**0.035J**	**0.0480 J**	---	---	0.2U	---
CADMIUM	7440-43-9	5	5	**0.067J**	---	**0.047J**	---	**0.312J**	---	**0.046J**	0.200 U	---	---	1.0U	---
CALCIUM	7440-70-2			**9430**	---	**14000**	---	**26200**	---	**13000**	**14900**	---	---	**213000**	---
CHROMIUM	7440-47-3	100	100	5.0U	---	5.0U	---	**17**	---	5.0U	5.00 U	---	---	**72.3**	---
COBALT	7440-48-4			**1.03**	---	**0.638J**	---	**10.6**	---	**0.087J**	**0.0970 J**	---	---	**29.6**	---
COPPER	7440-50-8	1300		3.0U	---	3.0U	---	**17.4**	---	3.0U	3.00 U	---	---	**164**	---
IRON	7439-89-6			**13000**	---	**134**	---	**37200**	---	**30200**	**33900**	---	---	**1280000**	---
LEAD	7439-92-1	15	15	**3.82**	---	1.0U	---	**20.3**	---	1.0U	0.500 U	---	---	**451**	---
MAGNESIUM	7439-95-4			**3720**	---	**631**	---	**5950**	---	**2610J**	**2620 J**	---	---	**850000**	---
MANGANESE	7439-96-5			**152**	---	**60.2**	---	**502**	---	**909J**	**909 J**	---	---	**6320**	---
MERCURY	7439-97-6	2	2	0.1U	---	0.1U	---	0.1U	---	0.1U	1.20 U	---	---	0.1U	---
NICKEL	7440-02-0			**0.7J**	---	**0.3J**	---	**18.3**	---	1.2U	0.100 U	---	---	**646**	---
POTASSIUM	7440-09-7			**2690**	---	**1330**	---	**7870**	---	**2200**	**2250**	---	---	**243000**	---
SELENIUM	7782-49-2	50	50	5.0U	---	3.0U	---	5.0U	---	3.0U	3.00 U	---	---	**0.2J**	---
SILVER	7440-22-4			0.4U	---	0.4U	---	**0.13J**	---	0.4U	0.400 U	---	---	1.0U	---
SODIUM	7440-23-5			**29800**	---	**9870**	---	**10400**	---	**25000J**	**25000 J**	---	---	**7360000**	---
THALLIUM	7440-28-0	2	2	0.4U	---	0.4U	---	**0.33J**	---	0.4U	0.400 U	---	---	0.4U	---
VANADIUM	7440-62-2			5.0U	---	5.0U	---	**29.4**	---	5.0U	5.00 U	---	---	5.0U	---
ZINC	7440-66-6			**5.9J**	---	**63.6**	---	**250**	---	**4.5J**	8.00 U	---	---	**207000**	---

Table 5-12
Summary of Groundwater Analytical Data - Off-Project Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	CDW-1		CDW-2		CDW-3		CDW-4				COE-1	
			SAMPLE ID	CDW-1-CI19	CDW-1-CI19-F	CDW-2-CI19	CDW-2-CI19-F	CDW-3-CI19	CDW-3-CI19-F	CDW-4-CI19	CDW-4-CI19-DUP	CDW-4-CI19-F	CDW-4-CI19-F-DUP	COE-1-CI19	COE-1-CI19-F
			SAMPLE DATE	23-Oct-19	23-Oct-19	24-Oct-19	24-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	25-Oct-19	22-Oct-19	22-Oct-19
			QC IDENTIFIER												
ANALYTE	**CAS**	**MCL**	**RIDEM GA**												
METALS DISSOLVED (µg/L)															
ALUMINUM, DISSOLVED	7429-90-5			---	**134**	---	100 U	---	**1820**	---	---	100U	100U	---	40U
ANTIMONY, DISSOLVED	7440-36-0	6	6	---	1.0U	---	1.00 U	---	1.0U	---	---	1.0U	1.0U	---	**0.056J**
ARSENIC, DISSOLVED	7440-38-2	10	10	---	4.0U	---	4.00 U	---	4.0U	---	---	4.0U	4.0U	---	4.0U
BARIUM, DISSOLVED	7440-39-3	2000	2000	---	**15.6**	---	**10.9**	---	**13.9**	---	---	**26.1**	**26.3**	---	**14**
BERYLLIUM, DISSOLVED	7440-41-7	4	4	---	**0.04J**	---	1.00 U	---	1.0U	---	---	1.0U	0.2U	---	0.2U
CADMIUM, DISSOLVED	7440-43-9	5	5	---	0.2U	---	**0.0920 J**	---	**0.07J**	---	---	0.2U	**0.03J**	---	1.0U
CALCIUM, DISSOLVED	7440-70-2			---	**9520**	---	**14200**	---	**17900**	---	---	**15100**	**14800**	---	**237000**
CHROMIUM, DISSOLVED	7440-47-3	100	100	---	5.0U	---	5.00 U	---	5.0U	---	---	5.0U	5.0U	---	5.0U
COBALT, DISSOLVED	7440-48-4			---	**0.956J**	---	1.00 U	---	**1.36**	---	---	1.0U	1.0U	---	**22.3**
COPPER, DISSOLVED	7440-50-8	1300		---	3.0U	---	**3.94**	---	3.0U	---	---	3.0U	3.0U	---	**5.96**
IRON, DISSOLVED	7439-89-6			---	**12700**	---	**85.0 J**	---	**1980**	---	---	**34600**	**33900**	---	**1210000**
LEAD, DISSOLVED	7439-92-1	15	15	---	1.0U	---	0.500 U	---	1.0U	---	---	0.5U	0.5U	---	**56.1**
MAGNESIUM, DISSOLVED	7439-95-4			---	**3740**	---	**605**	---	**974**	---	---	**2770**	**2740**	---	**888000**
MANGANESE, DISSOLVED	7439-96-5			---	**151**	---	**60.7**	---	**52.1**	---	---	**957**	**945**	---	**6650**
MERCURY, DISSOLVED	7439-97-6	2	2	---	0.1U	---	0.100 U	---	0.2U	---	---	0.2U	0.2U	---	0.1U
NICKEL, DISSOLVED	7440-02-0			---	**0.58J**	---	**0.550 J**	---	**1.1J**	---	---	**0.21J**	1.2U	---	**451**
POTASSIUM, DISSOLVED	7440-09-7			---	**2720**	---	**1290**	---	**1350**	---	---	**2330**	**2290**	---	**263000**
SELENIUM, DISSOLVED	7782-49-2	50	50	---	3.0U	---	3.00 U	---	5.0U	---	---	3.0U	3.0U	---	3.0U
SILVER, DISSOLVED	7440-22-4			---	0.4U	---	0.400 UJ	---	0.4U	---	---	0.4U	0.4U	---	0.4U
SODIUM, DISSOLVED	7440-23-5			---	**30400**	---	**9850**	---	**7860**	---	---	**26200**	**25800**	---	**7650000**
THALLIUM, DISSOLVED	7440-28-0	2	2	---	0.4U	---	0.400 U	---	0.4U	---	---	0.4U	0.4U	---	0.4U
VANADIUM, DISSOLVED	7440-62-2			---	5.0U	---	5.00 U	---	5.0U	---	---	5.0U	5.0U	---	4.0U
ZINC, DISSOLVED	7440-66-6			---	**6.2J**	---	**62.6 J**	---	**54.1**	---	---	8.0U	**4.9J**	---	**130000**

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds MCL or State Specifc Standard for GA Groundater

Table 5-12
Summary of Groundwater Analytical Data - Off-Project Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	COE-2		COE-3		COE-5		COE-6		COE-7		MW-106D	
			SAMPLE ID	COE-2-CI19	COE-2-CI19-F	COE-3-CI19	COE-3-CI19-F	COE-5-CI19	COE-5-CI19-F	COE-6-CI19	COE-6-CI19-F	COE-7-CI19	COE-7-CI19-F	MW-106D-CI19	MW-106D-CI19-F
			SAMPLE DATE	23-Oct-19	23-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	28-Oct-19	28-Oct-19	29-Oct-19	29-Oct-19	23-Oct-19	23-Oct-19
			QC IDENTIFIER												
ANALYTE	**CAS**	**MCL**	**RIDEM GA**												
VOCs (µg/L)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1,1-TRICHLOROETHANE	71-55-6	200	200	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1,2-TRICHLOROETHANE	79-00-5	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1-DICHLOROETHANE	75-34-3	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1-DICHLOROETHENE	75-35-4	7	7	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,1-DICHLOROPROPENE	563-58-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,2,3-TRICHLOROBENZENE	87-61-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,2,3-TRICHLOROPROPANE	96-18-4	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,2,4-TRICHLOROBENZENE	120-82-1	70	---	7.4U	---	0.5U	---	0.5U	---	6.9U	---	0.5U	---	0.5U	---
1,2,4-TRIMETHYLBENZENE	95-63-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	**0.38J**	---	0.5U	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.2	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---
1,2-DIBROMOETHANE	106-93-4	---	0.05	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	600	---	7.4U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,2-DICHLOROETHANE	107-06-2	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,2-DICHLOROPROPANE	78-87-5	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,3,5-TRIMETHYLBENZENE	108-67-8	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	0.5U	---	0.5U	---	7.2UJ	---	6.9U	---	7.1U	---	7.1UJ	---
1,3-DICHLOROPROPANE	142-28-9	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	75	---	7.4U	---	0.5U	---	7.2U	---	6.9U	---	0.5U	---	7.1U	---
2,2-DICHLOROPROPANE	594-20-7	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
2-BUTANONE (MEK)	78-93-3	---	---	2.5U	---	2.5U	---	**2J**	---	2.5U	---	2.5U	---	2.5U	---
2-CHLOROTOLUENE	95-49-8	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
2-HEXANONE	591-78-6	---	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---
4-CHLOROTOLUENE	106-43-4	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
4-ISOPROPYLTOLUENE	99-87-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
4-METHYL-2-PENTANONE	108-10-1	---	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---
ACETONE	67-64-1	---	---	2.5U	---	2.5U	---	**4.8J**	---	2.5U	---	2.5U	---	2.5U	---
BENZENE	71-43-2	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
BROMOBENZENE	108-86-1	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
BROMOMETHANE	74-83-9	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
BROMOCHLOROMETHANE	74-97-5	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
BROMODICHLOROMETHANE	75-27-4	80	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
BROMOFORM	75-25-2	80	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
CARBON DISULFIDE	75-15-0	---	---	**0.83J**	---	**0.37J**	---	**0.67J**	---	0.5U	---	0.5U	---	0.5U	---
CARBON TETRACHLORIDE	56-23-5	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
CHLOROBENZENE	108-90-7	100	100	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
CHLOROETHANE	75-00-3	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
CHLOROFORM	67-66-3	80	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
CHLOROMETHANE	74-87-3	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
CIS-1,2-DICHLOROETHENE	156-59-2	70	70	0.5U	---	**40**	---	0.5U	---	**0.92J**	---	0.5U	---	**5.4**	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
DIBROMOCHLOROMETHANE	124-48-1	80	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
DIBROMOMETHANE	74-95-3	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
DICHLORODIFLUOROMETHANE	75-71-8	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
DIISOPROPYL ETHER	108-20-3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	700	700	0.5U	---	0.5U	---	0.5U	---	**20**	---	0.5U	---	0.5U	---
HEXACHLOROBUTADIENE	87-68-3	---	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---
ISOPROPYLBENZENE	98-82-8	---	---	0.5U	---	0.5U	---	0.5U	---	**0.8J**	---	**3.3**	---	0.5U	---
METHYL BROMIDE	74-83-9	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
METHYL TERT-BUTYL ETHER	1634-04-4	---	40	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
METHYLENE CHLORIDE	75-09-2	5	5	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---
NAPHTHALENE	91-20-3	---	20	0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	0.094UJ	---
N-BUTYL BENZENE	104-51-8	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
N-PROPYL BENZENE	103-65-1	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	**0.96J**	---	0.5U	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
SEC-BUTYL BENZENE	135-98-8	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	**0.6J**	---	0.5U	---
STYRENE	100-42-5	100	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---

Table 5-12
Summary of Groundwater Analytical Data - Off-Project Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	COE-2		COE-3		COE-5		COE-6		COE-7		MW-106D	
				SAMPLE ID	COE-2-CI19	COE-2-CI19-F	COE-3-CI19	COE-3-CI19-F	COE-5-CI19	COE-5-CI19-F	COE-6-CI19	COE-6-CI19-F	COE-7-CI19	COE-7-CI19-F	MW-106D-CI19	MW-106D-CI19-F
				SAMPLE DATE	23-Oct-19	23-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	28-Oct-19	28-Oct-19	29-Oct-19	29-Oct-19	23-Oct-19	23-Oct-19
				QC IDENTIFIER												
ANALYTE	**CAS**	**MCL**	**RIDEM GA**													
VOCs (µg/L)																
TERT-BUTYLBENZENE	98-06-6	---	---		0.5U	---	0.5U	---	0.5U	---	0.5U	---	**0.71J**	---	0.5U	---
TETRACHLOROETHENE	127-18-4	5	5		0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
TETRAHYDROFURAN	109-99-9	---	---		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TOLUENE	108-88-3	1000	1000		0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
TRANS-1,2-DICHLOROETHENE	156-60-5	100	100		0.5U	---	**0.42J**	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---		0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
TRICHLOROETHYLENE	79-01-6	5	5		0.5U	---	**0.64J**	---	0.5U	---	**0.9J**	---	0.5U	---	**4.9**	---
TRICHLOROFLUOROMETHANE	75-69-4	---	---		1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
VINYL CHLORIDE	75-01-4	2	2		1.0U	---	**0.98J**	---	1.0U	---	**0.32J**	---	1.0U	---	1.0U	---
XYLENE O	95-47-6	---	---		0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
XYLENE P,M	179601-23-1	---	---		1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---
TOTAL XYLENES	1330-20-7	10000	10000		0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
SVOC (µg/L)																
1,2,4-TRICHLOROBENZENE	120-82-1	70	---		7.4U	---	0.5U	---	0.5U	---	6.9U	---	0.5U	---	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	600	---		7.4U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---		0.5U	---	0.5U	---	7.2UJ	---	6.9U	---	7.1U	---	7.1UJ	---
1,4-DICHLOROBENZENE	106-46-7	75	---		7.4U	---	0.5U	---	7.2U	---	6.9U	---	0.5U	---	7.1U	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2,4,5-TRICHLOROPHENOL	95-95-4	---	---		19U	---	18U	---	18U	---	17U	---	18U	---	18U	---
2,4,6-TRICHLOROPHENOL	88-06-2	---	---		7.4U	---	7.2UJ	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2,4-DICHLOROPHENOL	120-83-2	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2,4-DIMETHYLPHENOL	105-67-9	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2,4-DINITROPHENOL	51-28-5	---	---		19U	---	18UJ	---	18U	---	17U	---	18U	---	18U	---
2,4-DINITROTOLUENE	121-14-2	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2,6-DINITROTOLUENE	606-20-2	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
trans-1,3-Dichloropropene	10061-02-6	---	---		0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---
2-CHLORONAPHTHALENE	91-58-7	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2-CHLOROPHENOL	95-57-8	---	---		7.4U	---	7.2UJ	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
2-NITROANILINE	88-74-4	---	---		19U	---	18U	---	18U	---	17U	---	18U	---	18U	---
2-NITROPHENOL	88-75-5	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
3,3'-DICHLOROBENZIDINE	91-94-1	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
3-NITROANILINE	99-09-2	---	---		19U	---	18U	---	18U	---	17U	---	18U	---	18U	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	---	---		19U	---	18U	---	18U	---	17U	---	18U	---	18U	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
4-CHLORO-3-METHYLPHENOL	59-50-7	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
4-CHLOROANILINE	106-47-8	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
4-NITROANILINE	100-01-6	---	---		19U	---	18U	---	18U	---	17U	---	18U	---	18U	---
4-NITROPHENOL	100-02-7	---	---		19UJ	---	18UJ	---	18UJ	---	17UJ	---	18UJ	---	18UJ	---
BENZOIC ACID	65-85-0	---	---		19UJ	---	---	---	18UJ	---	17UJ	---	18UJ	---	18UJ	---
BENZYL ALCOHOL	100-51-6	---	---		15UJ	---	14UJ	---	14UJ	---	14U	---	14U	---	14UJ	---
BENZYL BUTYL PHTHALATE	85-68-7	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	6	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
CARBAZOLE	86-74-8	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
CRESOLS, M- & P-		---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
DIBENZOFURAN	132-64-9	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
DIETHYL PHTHALATE	84-66-2	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
DIMETHYL PHTHALATE	131-11-3	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
DI-N-BUTYL PHTHALATE	84-74-2	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
DI-N-OCTYL PHTHALATE	117-84-0	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
HEXACHLOROBENZENE	118-74-1	1	1		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
HEXACHLOROETHANE	67-72-1	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
ISOPHORONE	78-59-1	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---

Table 5-12
Summary of Groundwater Analytical Data - Off-Project Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	COE-2		COE-3		COE-5		COE-6		COE-7		MW-106D	
				SAMPLE ID	COE-2-CI19	COE-2-CI19-F	COE-3-CI19	COE-3-CI19-F	COE-5-CI19	COE-5-CI19-F	COE-6-CI19	COE-6-CI19-F	COE-7-CI19	COE-7-CI19-F	MW-106D-CI19	MW-106D-CI19-F
				SAMPLE DATE	23-Oct-19	23-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	28-Oct-19	28-Oct-19	29-Oct-19	29-Oct-19	23-Oct-19	23-Oct-19
				QC IDENTIFIER												
ANALYTE	**CAS**	**MCL**	**RIDEM GA**													
SVOC (µg/L)																
NITROBENZENE	98-95-3	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
N-NITROSODIMETHYLAMINE	62-75-9	---	---		7.4UJ	---	7.2UJ	---	7.2UJ	---	6.9U	---	7.1U	---	7.1UJ	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	---	---		7.4U	---	7.2U	---	7.2U	---	6.9U	---	7.1U	---	7.1U	---
N-NITROSODIPHENYLAMINE	86-30-6	---	---		7.4UJ	---	7.2UJ	---	7.2UJ	---	6.9U	---	7.1U	---	7.1UJ	---
PENTACHLOROPHENOL	87-86-5	1	---		19U	---	18UJ	---	18U	---	17U	---	18U	---	18U	---
PHENOL	108-95-2	---	---		7.4UJ	---	7.2UJ	---	7.2UJ	---	6.9UJ	---	7.1UJ	---	7.1UJ	---
PAHs (µg/L)																
1-METHYLNAPHTHALENE	90-12-0	---	---		0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	0.094UJ	---
2-METHYLNAPHTHALENE	91-57-6	---	---		0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	0.094UJ	---
ACENAPHTHENE	83-32-9	---	---		0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	0.094UJ	---
ACENAPHTHYLENE	208-96-8	---	---		0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	0.094UJ	---
ANTHRACENE	120-12-7	---	---		0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	0.094UJ	---
BENZO(A)ANTHRACENE	56-55-3	---	---		**0.46**	---	0.096U	---	0.096U	---	0.092U	---	**0.062J**	---	0.094UJ	---
BENZO(A)PYRENE	50-32-8	0.2	0.2		**0.23**	---	0.096UJ	---	0.096U	---	0.092U	---	**0.068J**	---	0.094UJ	---
BENZO(B)FLUORANTHENE	205-99-2	---	---		**0.45**	---	0.096UJ	---	0.096U	---	0.092U	---	0.094U	---	0.094UJ	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---		**0.17J**	---	0.096UJ	---	0.096U	---	0.092U	---	0.094U	---	0.094UJ	---
BENZO(K)FLUORANTHENE	207-08-9	---	---		0.099U	---	0.096UJ	---	0.096U	---	0.092U	---	0.094U	---	0.094UJ	---
CHRYSENE	218-01-9	---	---		**0.26**	---	0.096U	---	0.096U	---	0.18U	---	0.094U	---	0.094UJ	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---		0.099U	---	0.096UJ	---	0.096U	---	0.092U	---	0.094U	---	0.094UJ	---
FLUORANTHENE	206-44-0	---	---		**0.4**	---	0.096U	---	0.096U	---	0.092U	---	**0.11J**	---	0.094UJ	---
FLUORENE	86-73-7	---	---		0.099U	---	0.096U	---	0.096U	---	0.092U	---	**0.09J**	---	0.094UJ	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---		**0.26**	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	0.094UJ	---
NAPHTHALENE	91-20-3	---	20		0.099U	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	0.094UJ	---
PHENANTHRENE	85-01-8	---	---		**0.21**	---	0.096U	---	0.096U	---	0.092U	---	**0.074J**	---	0.094UJ	---
PYRENE	129-00-0	---	---		**0.4**	---	0.096U	---	0.096U	---	0.092U	---	0.094U	---	**0.084J**	---
PCBs (µg/L)																
AROCLOR 1016	12674-11-2	---	---		0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.23UJ	---
AROCLOR 1221	11104-28-2	---	---		0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.23UJ	---
AROCLOR 1232	11141-16-5	---	---		0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.23UJ	---
AROCLOR 1242	53469-21-9	---	---		0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.23UJ	---
AROCLOR 1248	12672-29-6	---	---		0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.23UJ	---
AROCLOR 1254	11097-69-1	---	---		0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.23UJ	---
AROCLOR 1260	11096-82-5	---	---		0.24UJ	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.23UJ	---
TOTAL PCBs		0.5	**0.5**		1.6UJ	---	1.7UJ	---	1.7UJ	---	1.7UJ	---	1.6UJ	---	1.6UJ	---
METALS TOTAL (µg/L)																
ALUMINUM	7429-90-5				**47.8J**	---	**9300**	---	100U	---	100U	---	100U	---	**18J**	---
ANTIMONY	7440-36-0	6	6		0.50U	---	1.0U	---	1.0U	---	0.5U	---	**0.602J**	---	0.50U	---
ARSENIC	7440-38-2	10	10		4.0U	---	**4.9J**	---	4.0U	---	4.0U	---	4.0U	---	4.0U	---
BARIUM	7440-39-3	2000	2000		**23.3**	---	**15.7J**	---	**11**	---	**10.5**	---	**10.6**	---	**38.7**	---
BERYLLIUM	7440-41-7	4	4		0.2U	---	1.0U	---	0.2U	---	0.20U	---	0.2U	---	**0.11J**	---
CADMIUM	7440-43-9	5	5		**1.2**	---	1.0U	---	1.0U	---	0.20U	---	**0.625J**	---	0.20U	---
CALCIUM	7440-70-2				**21300**	---	**9070**	---	**337000**	---	**11900**	---	**6870**	---	**48700**	---
CHROMIUM	7440-47-3	100	100		5.0U	---	**51.8**	---	**16**	---	5.0U	---	5.0U	---	5.0U	---
COBALT	7440-48-4				**1.18**	---	**3.88**	---	**17.3**	---	**3.08**	---	**3.11**	---	**6.7**	---
COPPER	7440-50-8	1300			**3.34**	---	**29.6**	---	**7.55**	---	3.0U	---	3.0U	---	3.0U	---
IRON	7439-89-6				**31000**	---	**113000**	---	**189000**	---	**10400**	---	**26300**	---	**2960**	---
LEAD	7439-92-1	15	15		**11.2**	---	**6.82**	---	**3.97**	---	**3.66**	---	**0.59J**	---	0.50U	---
MAGNESIUM	7439-95-4				**16900**	---	**5010**	---	**980000**	---	**1240**	---	**1280**	---	**12700**	---
MANGANESE	7439-96-5				**496**	---	**1110**	---	**1400**	---	**222**	---	**535**	---	**944**	---
MERCURY	7439-97-6	2	2		0.1U	---	**0.013J**	---	0.1U	---	0.1U	---	0.1U	---	0.1U	---
NICKEL	7440-02-0				2.0U	---	**27**	---	**15.5**	---	2.0U	---	2.0U	---	**8.48**	---
POTASSIUM	7440-09-7				**16100**	---	**3030**	---	**314000**	---	**3030**	---	**1500**	---	**5430**	---
SELENIUM	7782-49-2	50	50		3.0U	---	**0.36J**	---	**0.23J**	---	3.0U	---	3.0U	---	3.0U	---
SILVER	7440-22-4				0.4U	---	1.0U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---
SODIUM	7440-23-5				**256000**	---	**22800J**	---	**9300000**	---	**5600**	---	**10400**	---	**27400**	---
THALLIUM	7440-28-0	2	2		0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---
VANADIUM	7440-62-2				4.0U	---	**16.4**	---	5.0U	---	4.0U	---	5.0U	---	4.0U	---
ZINC	7440-66-6				**6720**	---	**27100**	---	**4100**	---	**353**	---	**158**	---	**19**	---

Table 5-12
Summary of Groundwater Analytical Data - Off-Project Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	COE-2		COE-3		COE-5		COE-6		COE-7		MW-106D	
			SAMPLE ID	COE-2-CI19	COE-2-CI19-F	COE-3-CI19	COE-3-CI19-F	COE-5-CI19	COE-5-CI19-F	COE-6-CI19	COE-6-CI19-F	COE-7-CI19	COE-7-CI19-F	MW-106D-CI19	MW-106D-CI19-F
			SAMPLE DATE	23-Oct-19	23-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	28-Oct-19	28-Oct-19	29-Oct-19	29-Oct-19	23-Oct-19	23-Oct-19
			QC IDENTIFIER												
ANALYTE	**CAS**	**MCL**	**RIDEM GA**												
METALS DISSOLVED (µg/L)															
ALUMINUM, DISSOLVED	7429-90-5			---	**24J**	---	**178**	---	40U	---	**762**	---	100U	---	**124**
ANTIMONY, DISSOLVED	7440-36-0	6	6	---	0.5U	---	0.5U	---	0.5U	---	**2.84**	---	0.5U	---	0.5U
ARSENIC, DISSOLVED	7440-38-2	10	10	---	4.0U	---	4.0U	---	4.0U	---	4.0U	---	4.0U	---	4.0U
BARIUM, DISSOLVED	7440-39-3	2000	2000	---	**22.9**	---	**5.74**	---	**10.3**	---	**10.7**	---	**10.8**	---	**37.6**
BERYLLIUM, DISSOLVED	7440-41-7	4	4	---	0.2U	---	0.2U	---	0.2U	---	0.2U	---	0.2U	---	**0.13J**
CADMIUM, DISSOLVED	7440-43-9	5	5	---	**0.417J**	---	0.2U	---	0.2U	---	0.2U	---	**0.27J**	---	0.2U
CALCIUM, DISSOLVED	7440-70-2			---	**20700**	---	**9180J**	---	**335000**	---	**11800**	---	**6810**	---	**46100**
CHROMIUM, DISSOLVED	7440-47-3	100	100	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U
COBALT, DISSOLVED	7440-48-4			---	**0.979J**	---	**0.47J**	---	**9.2**	---	**2.74**	---	**3.13**	---	**6.5**
COPPER, DISSOLVED	7440-50-8	1300		---	**0.64J**	---	3.0U	---	3.0U	---	3.0U	---	3.0U	---	**1.3J**
IRON, DISSOLVED	7439-89-6			---	**19100**	---	**34300J**	---	**77900**	---	**10200**	---	**26400**	---	**3090**
LEAD, DISSOLVED	7439-92-1	15	15	---	**4.35**	---	**0.2J**	---	**0.083J**	---	**6.14**	---	**0.32J**	---	**0.13J**
MAGNESIUM, DISSOLVED	7439-95-4			---	**16600**	---	**4080**	---	**980000**	---	**1280**	---	**1260**	---	**11900**
MANGANESE, DISSOLVED	7439-96-5			---	**450**	---	**788**	---	**675**	---	**235**	---	**532**	---	**896**
MERCURY, DISSOLVED	7439-97-6	2	2	---	0.1U	---	0.2UJ	---	0.1U	---	0.1U	---	0.1U	---	0.1U
NICKEL, DISSOLVED	7440-02-0			---	2.0U	---	**2.14**	---	**5.54**	---	2.0U	---	2.0U	---	**8**
POTASSIUM, DISSOLVED	7440-09-7			---	**16100**	---	**2320J**	---	**314000**	---	**3190**	---	**1450**	---	**5180**
SELENIUM, DISSOLVED	7782-49-2	50	50	---	3.0U	---	3.0U	---	3.0U	---	3.0U	---	3.0U	---	3.0U
SILVER, DISSOLVED	7440-22-4			---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U
SODIUM, DISSOLVED	7440-23-5			---	**252000**	---	**22700J**	---	**8300000**	---	**5860**	---	**10400**	---	**25400**
THALLIUM, DISSOLVED	7440-28-0	2	2	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U
VANADIUM, DISSOLVED	7440-62-2			---	4.0U	---	4.0U	---	**0.91J**	---	4.0U	---	4.0U	---	4.0U
ZINC, DISSOLVED	7440-66-6			---	**2810**	---	**3010**	---	**98.4**	---	**51.2**	---	**146**	---	**17**

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds MCL or State Specifc Standard for GA Groundater

Table 5-12
Summary of Groundwater Analytical Data - Off-Project Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	MW-106S		PZ-1		PZ-2		WP-5		WP-6		W98-1	
			SAMPLE ID	MW-106S-CI19	MW-106S-CI19-F	PZ-1-CI19	PZ-1-CI19-F	PZ-2-CI19	PZ-2-CI19-F	WP-5-CI19	WP-5-CI19-F	WP-6-CI19	WP-6-CI19-F	W98-1-CI19	W98-1-CI19-F
			SAMPLE DATE	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	29-Oct-19	29-Oct-19	28-Oct-19	28-Oct-19	22-Oct-19	22-Oct-19
			QC IDENTIFIER												
ANALYTE	**CAS**	**MCL**	**RIDEM GA**												
VOCs (µg/L)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,1,1-TRICHLOROETHANE	71-55-6	200	200	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,1,2-TRICHLORO-1,2,2-	76-13-1	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,1,2-TRICHLOROETHANE	79-00-5	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,1-DICHLOROETHANE	75-34-3	---	---	**0.33J**	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,1-DICHLOROETHENE	75-35-4	7	7	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,1-DICHLOROPROPENE	563-58-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,2,3-TRICHLOROBENZENE	87-61-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,2,3-TRICHLOROPROPANE	96-18-4	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,2,4-TRICHLOROBENZENE	120-82-1	70	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	0.5U	---
1,2,4-TRIMETHYLBENZENE	95-63-6	---	---	0.5U	---	0.5U	---	0.5U	---	**45**	---	0.5UJ	---	0.5U	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.2	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.75UJ	---	0.75U	---
1,2-DIBROMOETHANE	106-93-4	---	0.05	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	600	---	0.5U	---	7.1U	---	0.5U	---	0.5U	---	0.5UJ	---	7.1U	---
1,2-DICHLOROETHANE	107-06-2	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,2-DICHLOROPROPANE	78-87-5	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,3,5-TRIMETHYLBENZENE	108-67-8	---	---	0.5U	---	0.5U	---	0.5U	---	**1.9**	---	0.5UJ	---	0.5U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	7.1UJ	---	0.5U	---	0.5U	---	7.2U	---	7.1U	---	0.5U	---
1,3-DICHLOROPROPANE	142-28-9	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	75	---	0.5U	---	0.5U	---	7.1U	---	7.2U	---	0.5UJ	---	7.1U	---
2,2-DICHLOROPROPANE	594-20-7	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
2-BUTANONE (MEK)	78-93-3	---	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5UJ	---	2.5U	---
2-CHLOROTOLUENE	95-49-8	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
2-HEXANONE	591-78-6	---	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5UJ	---	2.5U	---
4-CHLOROTOLUENE	106-43-4	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
4-ISOPROPYLTOLUENE	99-87-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
4-METHYL-2-PENTANONE	108-10-1	---	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5UJ	---	2.5U	---
ACETONE	67-64-1	---	---	2.5U	---	2.5U	---	2.5U	---	2.5U	---	5.0UJ	---	2.5U	---
BENZENE	71-43-2	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
BROMOBENZENE	108-86-1	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
BROMOMETHANE	74-83-9	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0UJ	---	1.0U	---
BROMOCHLOROMETHANE	74-97-5	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
BROMODICHLOROMETHANE	75-27-4	80	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
BROMOFORM	75-25-2	80	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
CARBON DISULFIDE	75-15-0	---	---	0.5U	---	0.5U	---	**0.83J**	---	0.5U	---	0.5UJ	---	0.5U	---
CARBON TETRACHLORIDE	56-23-5	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
CHLOROBENZENE	108-90-7	100	100	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
CHLOROETHANE	75-00-3	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0UJ	---	1.0U	---
CHLOROFORM	67-66-3	80	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
CHLOROMETHANE	74-87-3	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0UJ	---	1.0U	---
CIS-1,2-DICHLOROETHENE	156-59-2	70	70	**40**	---	**6.7**	---	**0.24J**	---	0.5U	---	0.5UJ	---	**5.9**	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
DIBROMOCHLOROMETHANE	124-48-1	80	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
DIBROMOMETHANE	74-95-3	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
DICHLORODIFLUOROMETHANE	75-71-8	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0UJ	---	1.0U	---
DIISOPROPYL ETHER	108-20-3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	700	700	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
HEXACHLOROBUTADIENE	87-68-3	---	---	0.75U	---	0.75U	---	0.75U	---	0.75U	---	0.75UJ	---	0.75U	---
ISOPROPYLBENZENE	98-82-8	---	---	0.5U	---	0.5U	---	0.5U	---	**6.2**	---	0.5UJ	---	0.5U	---
METHYL BROMIDE	74-83-9	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0UJ	---	1.0U	---
METHYL TERT-BUTYL ETHER	1634-04-4	---	40	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
METHYLENE CHLORIDE	75-09-2	5	5	2.5U	---	2.5U	---	2.5U	---	2.5U	---	2.5UJ	---	2.5U	---
NAPHTHALENE	91-20-3	---	20	0.094U	---	0.095U	---	0.095U	---	**34**	---	0.095U	---	0.094U	---
N-BUTYL BENZENE	104-51-8	---	---	0.5U	---	0.5U	---	0.5U	---	**1.8**	---	0.5UJ	---	0.5U	---
N-PROPYL BENZENE	103-65-1	---	---	0.5U	---	0.5U	---	0.5U	---	**6**	---	0.5UJ	---	0.5U	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
SEC-BUTYL BENZENE	135-98-8	---	---	0.5U	---	0.5U	---	0.5U	---	**4.2**	---	0.5UJ	---	0.5U	---
STYRENE	100-42-5	100	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---

Table 5-12
Summary of Groundwater Analytical Data - Off-Project Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION				MW-106S		PZ-1		PZ-2		WP-5		WP-6		W98-1	
SAMPLE ID				MW-106S-CI19	MW-106S-CI19-F	PZ-1-CI19	PZ-1-CI19-F	PZ-2-CI19	PZ-2-CI19-F	WP-5-CI19	WP-5-CI19-F	WP-6-CI19	WP-6-CI19-F	W98-1-CI19	W98-1-CI19-F
SAMPLE DATE				22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	29-Oct-19	29-Oct-19	28-Oct-19	28-Oct-19	22-Oct-19	22-Oct-19
QC IDENTIFIER															
ANALYTE	**CAS**	**MCL**	**RIDEM GA**												
VOCs (µg/L)															
TERT-BUTYLBENZENE	98-06-6	---	---	0.5U	---	0.5U	---	0.5U	---	**2.4**	---	0.5UJ	---	0.5U	---
TETRACHLOROETHENE	127-18-4	5	5	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
TETRAHYDROFURAN	109-99-9	---	---	5.0U	---	**2.8J**	---	5.0U	---	5.0U	---	5.0UJ	---	5.0U	---
TOLUENE	108-88-3	1000	1000	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
TRANS-1,2-DICHLOROETHENE	156-60-5	100	100	**0.4J**	---	**1.2**	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
TRICHLOROETHYLENE	79-01-6	5	5	**14**	---	**1.2**	---	0.5U	---	0.5U	---	0.5UJ	---	**13**	---
TRICHLOROFLUOROMETHANE	75-69-4	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0UJ	---	1.0U	---
VINYL CHLORIDE	75-01-4	2	2	**7**	---	1.0U	---	1.0U	---	1.0U	---	1.0UJ	---	1.0U	---
XYLENE O	95-47-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
XYLENE P,M	179601-23-1	---	---	1.0U	---	1.0U	---	1.0U	---	1.0U	---	1.0UJ	---	1.0U	---
TOTAL XYLENES	1330-20-7	10000	10000	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
SVOC (µg/L)															
1,2,4-TRICHLOROBENZENE	120-82-1	70	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	0.5U	---
1,2-DICHLOROBENZENE	95-50-1	600	---	0.5U	---	7.1U	---	0.5U	---	0.5U	---	0.5UJ	---	7.1U	---
1,3-DICHLOROBENZENE	541-73-1	---	---	7.1UJ	---	0.5U	---	0.5U	---	7.2U	---	7.1U	---	0.5U	---
1,4-DICHLOROBENZENE	106-46-7	75	---	0.5U	---	0.5U	---	7.1U	---	7.2U	---	0.5UJ	---	7.1U	---
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
2,4,5-TRICHLOROPHENOL	95-95-4	---	---	18U	---	18U	---	18U	---	18U	---	18U	---	18U	---
2,4,6-TRICHLOROPHENOL	88-06-2	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
2,4-DICHLOROPHENOL	120-83-2	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
2,4-DIMETHYLPHENOL	105-67-9	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
2,4-DINITROPHENOL	51-28-5	---	---	18U	---	18U	---	18U	---	18U	---	18U	---	18U	---
2,4-DINITROTOLUENE	121-14-2	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
2,6-DINITROTOLUENE	606-20-2	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
trans-1,3-Dichloropropene	10061-02-6	---	---	0.5U	---	0.5U	---	0.5U	---	0.5U	---	0.5UJ	---	0.5U	---
2-CHLORONAPHTHALENE	91-58-7	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
2-CHLOROPHENOL	95-57-8	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
2-METHYLPHENOL (O-CRESOL)	95-48-7	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
2-NITROANILINE	88-74-4	---	---	18U	---	18U	---	18U	---	18U	---	18U	---	18U	---
2-NITROPHENOL	88-75-5	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
3,3'-DICHLOROBENZIDINE	91-94-1	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
3-NITROANILINE	99-09-2	---	---	18U	---	18U	---	18U	---	18U	---	18U	---	18U	---
4,6-DINITRO-2-METHYLPHENOL	534-52-1	---	---	18U	---	18U	---	18U	---	18U	---	18U	---	18U	---
4-BROMOPHENYL PHENYL ETHER	101-55-3	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
4-CHLORO-3-METHYLPHENOL	59-50-7	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
4-CHLOROANILINE	106-47-8	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
4-NITROANILINE	100-01-6	---	---	18U	---	18U	---	18U	---	18U	---	18U	---	18U	---
4-NITROPHENOL	100-02-7	---	---	18UJ	---	18UJ	---	18UJ	---	18UJ	---	18UJ	---	18UJ	---
BENZOIC ACID	65-85-0	---	---	18UJ	---	18UJ	---	18UJ	---	18UJ	---	18UJ	---	18UJ	---
BENZYL ALCOHOL	100-51-6	---	---	14UJ	---	14UJ	---	14UJ	---	14U	---	14U	---	14UJ	---
BENZYL BUTYL PHTHALATE	85-68-7	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
BIS(2-CHLOROETHOXY) METHANE	111-91-1	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
BIS(2-CHLOROETHYL) ETHER (2-	111-44-4	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	6	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
CARBAZOLE	86-74-8	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
CRESOLS, M- & P-		---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
DIBENZOFURAN	132-64-9	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
DIETHYL PHTHALATE	84-66-2	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
DIMETHYL PHTHALATE	131-11-3	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
DI-N-BUTYL PHTHALATE	84-74-2	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
DI-N-OCTYL PHTHALATE	117-84-0	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
HEXACHLOROBENZENE	118-74-1	1	1	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
HEXACHLOROETHANE	67-72-1	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
ISOPHORONE	78-59-1	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---

Table 5-12
Summary of Groundwater Analytical Data - Off-Project Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	MW-106S		PZ-1		PZ-2		WP-5		WP-6		W98-1	
			SAMPLE ID	MW-106S-CI19	MW-106S-CI19-F	PZ-1-CI19	PZ-1-CI19-F	PZ-2-CI19	PZ-2-CI19-F	WP-5-CI19	WP-5-CI19-F	WP-6-CI19	WP-6-CI19-F	W98-1-CI19	W98-1-CI19-F
			SAMPLE DATE	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	29-Oct-19	29-Oct-19	28-Oct-19	28-Oct-19	22-Oct-19	22-Oct-19
			QC IDENTIFIER												
ANALYTE	**CAS**	**MCL**	**RIDEM GA**												
SVOC (µg/L)															
NITROBENZENE	98-95-3	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
N-NITROSODIMETHYLAMINE	62-75-9	---	---	7.1UJ	---	7.1UJ	---	7.1UJ	---	7.2U	---	7.1U	---	7.1UJ	---
N-NITROSODI-N-PROPYLAMINE	621-64-7	---	---	7.1U	---	7.1U	---	7.1U	---	7.2U	---	7.1U	---	7.1U	---
N-NITROSODIPHENYLAMINE	86-30-6	---	---	7.1UJ	---	7.1UJ	---	7.1UJ	---	7.2U	---	7.1U	---	7.1UJ	---
PENTACHLOROPHENOL	87-86-5	1	---	18U	---	18U	---	18U	---	18U	---	18U	---	18U	---
PHENOL	108-95-2	---	---	7.1UJ	---	7.1UJ	---	7.1UJ	---	7.2UJ	---	7.1UJ	---	7.1UJ	---
PAHs (µg/L)															
1-METHYLNAPHTHALENE	90-12-0	---	---	0.094U	---	0.095U	---	0.095U	---	**18**	---	0.095U	---	0.094U	---
2-METHYLNAPHTHALENE	91-57-6	---	---	0.094U	---	0.095U	---	0.095U	---	**14**	---	0.095U	---	0.094U	---
ACENAPHTHENE	83-32-9	---	---	0.094U	---	0.095U	---	0.095U	---	**0.12J**	---	0.095U	---	0.094U	---
ACENAPHTHYLENE	208-96-8	---	---	0.094U	---	0.095U	---	0.095U	---	0.096U	---	0.095U	---	0.094U	---
ANTHRACENE	120-12-7	---	---	0.094U	---	0.095U	---	0.095U	---	0.096U	---	0.095U	---	0.094U	---
BENZO(A)ANTHRACENE	56-55-3	---	---	0.094U	---	0.095U	---	0.095U	---	**0.058J**	---	0.095U	---	0.094U	---
BENZO(A)PYRENE	50-32-8	0.2	0.2	0.094U	---	0.095U	---	0.095U	---	**0.09J**	---	0.095U	---	0.094U	---
BENZO(B)FLUORANTHENE	205-99-2	---	---	0.094U	---	0.095U	---	0.095U	---	**0.09J**	---	0.095U	---	0.094U	---
BENZO(G,H,I)PERYLENE	191-24-2	---	---	0.094U	---	0.095U	---	0.095U	---	**0.079J**	---	0.095U	---	0.094U	---
BENZO(K)FLUORANTHENE	207-08-9	---	---	0.094U	---	0.095U	---	0.095U	---	0.096U	---	0.095U	---	0.094U	---
CHRYSENE	218-01-9	---	---	0.094U	---	0.095U	---	0.095U	---	0.19U	---	0.095U	---	0.094U	---
DIBENZO(A,H)ANTHRACENE	53-70-3	---	---	0.094U	---	0.095U	---	0.095U	---	0.096U	---	0.095U	---	0.094U	---
FLUORANTHENE	206-44-0	---	---	0.094U	---	0.095U	---	0.095U	---	**0.089J**	---	0.095U	---	0.094U	---
FLUORENE	86-73-7	---	---	0.094U	---	0.095U	---	0.095U	---	**0.16J**	---	0.095U	---	0.094U	---
INDENO(1,2,3-CD)PYRENE	193-39-5	---	---	0.094U	---	0.095U	---	0.095U	---	0.096U	---	0.095U	---	0.094U	---
NAPHTHALENE	91-20-3	---	20	0.094U	---	0.095U	---	0.095U	---	**34**	---	0.095U	---	0.094U	---
PHENANTHRENE	85-01-8	---	---	0.094U	---	0.095U	---	0.095U	---	**0.082J**	---	0.095U	---	0.094U	---
PYRENE	129-00-0	---	---	0.094U	---	0.095U	---	0.095U	---	0.096U	---	0.095U	---	0.094U	---
PCBs (µg/L)															
AROCLOR 1016	12674-11-2	---	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23UJ	---
AROCLOR 1221	11104-28-2	---	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23UJ	---
AROCLOR 1232	11141-16-5	---	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23UJ	---
AROCLOR 1242	53469-21-9	---	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23UJ	---
AROCLOR 1248	12672-29-6	---	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23UJ	---
AROCLOR 1254	11097-69-1	---	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23UJ	---
AROCLOR 1260	11096-82-5	---	---	0.24UJ	---	0.24UJ	---	0.24UJ	---	0.23UJ	---	0.24UJ	---	0.23UJ	---
TOTAL PCBs		0.5	**0.5**	1.7UJ	---	1.7UJ	---	1.7UJ	---	1.6UJ	---	1.7UJ	---	1.6UJ	---
METALS TOTAL (µg/L)															
ALUMINUM	7429-90-5			100U	---	100U	---	100U	---	100U	---	**320**	---	100U	---
ANTIMONY	7440-36-0	6	6	1.0U	---	0.50U	---	1.0U	---	0.50U	---	0.50U	---	0.50U	---
ARSENIC	7440-38-2	10	10	**8.5**	---	4.0U	---	**4.8J**	---	**2.4J**	---	4.0U	---	4.0U	---
BARIUM	7440-39-3	2000	2000	**50.1**	---	**58.3**	---	**57**	---	**7.36**	---	**18.1**	---	**23.6**	---
BERYLLIUM	7440-41-7	4	4	1.0U	---	1.0U	---	1.0U	---	0.2U	---	1.0U	---	1.0U	---
CADMIUM	7440-43-9	5	5	1.0U	---	1.0U	---	0.20U	---	**0.037J**	---	1.0U	---	1.0U	---
CALCIUM	7440-70-2			**55000**	---	**203000**	---	**277000**	---	**9210**	---	**335**	---	**61100**	---
CHROMIUM	7440-47-3	100	100	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
COBALT	7440-48-4			1.0U	---	1.0U	---	1.0U	---	**1.42**	---	**6.84**	---	**5.09**	---
COPPER	7440-50-8	1300		3.0U	---	3.0U	---	3.0U	---	3.0U	---	**6.49**	---	2.0U	---
IRON	7439-89-6			**4040**	---	**12400**	---	**90J**	---	**32700**	---	**1470**	---	**16900**	---
LEAD	7439-92-1	15	15	**0.35J**	---	**0.16J**	---	0.50U	---	**0.59J**	---	1.0U	---	0.50U	---
MAGNESIUM	7439-95-4			**52800**	---	**374000**	---	**857000**	---	**1280**	---	**605**	---	**127000**	---
MANGANESE	7439-96-5			**1580**	---	**1080**	---	**54.8**	---	**1350**	---	**81.6**	---	**772**	---
MERCURY	7439-97-6	2	2	0.1U	---	0.1U	---	0.1U	---	0.1U	---	0.1U	---	0.1U	---
NICKEL	7440-02-0			2.0U	---	2.0U	---	2.0U	---	2.0U	---	**4.26**	---	**4.64**	---
POTASSIUM	7440-09-7			**14600**	---	**122000**	---	**254000**	---	**1160**	---	**1990**	---	**53700**	---
SELENIUM	7782-49-2	50	50	3.0U	---	3.0U	---	3.0U	---	3.0U	---	3.0U	---	3.0U	---
SILVER	7440-22-4			0.4U	---	0.4U	---	1.0U	---	0.4U	---	0.4U	---	0.4U	---
SODIUM	7440-23-5			**346000**	---	**3360000**	---	**7070000**	---	**8050**	---	**7870**	---	**1510000**	---
THALLIUM	7440-28-0	2	2	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---
VANADIUM	7440-62-2			**5.1**	---	5.0U	---	**6.38**	---	4.0U	---	4.0U	---	4.0U	---
ZINC	7440-66-6			**59.6**	---	**29**	---	**5.8J**	---	**18**	---	**140**	---	**21**	---

Table 5-12
Summary of Groundwater Analytical Data - Off-Project Red Maple Swamp
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	MW-106S		PZ-1		PZ-2		WP-5		WP-6		W98-1	
			SAMPLE ID	MW-106S-CI19	MW-106S-CI19-F	PZ-1-CI19	PZ-1-CI19-F	PZ-2-CI19	PZ-2-CI19-F	WP-5-CI19	WP-5-CI19-F	WP-6-CI19	WP-6-CI19-F	W98-1-CI19	W98-1-CI19-F
			SAMPLE DATE	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	22-Oct-19	29-Oct-19	29-Oct-19	28-Oct-19	28-Oct-19	22-Oct-19	22-Oct-19
			QC IDENTIFIER												
ANALYTE	**CAS**	**MCL**	**RIDEM GA**												
METALS DISSOLVED (µg/L)															
ALUMINUM, DISSOLVED	7429-90-5			---	**9.5J**	---	**18J**	---	**11J**	---	100U	---	**386**	---	40U
ANTIMONY, DISSOLVED	7440-36-0	6	6	---	0.5U	---	0.5U	---	0.5U	---	**0.19J**	---	0.5U	---	0.5U
ARSENIC, DISSOLVED	7440-38-2	10	10	---	**6.7**	---	4.0U	---	**4.4J**	---	**2.4J**	---	4.0U	---	4.0U
BARIUM, DISSOLVED	7440-39-3	2000	2000	---	**31**	---	**60.6**	---	**54.8**	---	**8.22**	---	**17.4**	---	**48.6**
BERYLLIUM, DISSOLVED	7440-41-7	4	4	---	**0.038J**	---	0.2U	---	**0.26J**	---	0.2U	---	**0.527J**	---	**0.15J**
CADMIUM, DISSOLVED	7440-43-9	5	5	---	0.2U	---	0.2U	---	0.2U	---	0.2U	---	**0.425J**	---	0.2U
CALCIUM, DISSOLVED	7440-70-2			---	**46600**	---	**209000**	---	**271000**	---	**9140**	---	**264**	---	**150000**
CHROMIUM, DISSOLVED	7440-47-3	100	100	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U
COBALT, DISSOLVED	7440-48-4			---	**0.14J**	---	**0.684J**	---	**0.066J**	---	**1.56**	---	**5.8**	---	**10.2**
COPPER, DISSOLVED	7440-50-8	1300		---	3.0U	---	2.0U	---	2.0U	---	3.0U	---	**5.27**	---	3.0U
IRON, DISSOLVED	7439-89-6			---	**3040**	---	**12700**	---	60U	---	**32300**	---	**1740**	---	**14500**
LEAD, DISSOLVED	7439-92-1	15	15	---	0.5U	---	0.5U	---	0.5U	---	**0.46J**	---	**0.48J**	---	0.5U
MAGNESIUM, DISSOLVED	7439-95-4			---	**36700**	---	**386000**	---	**814000**	---	**1260**	---	**574**	---	**322000**
MANGANESE, DISSOLVED	7439-96-5			---	**1120**	---	**1160**	---	**54.5**	---	**1350**	---	**75.8**	---	**1630**
MERCURY, DISSOLVED	7439-97-6	2	2	---	0.1U	---	0.1U	---	0.1U	---	0.1U	---	0.1U	---	0.1U
NICKEL, DISSOLVED	7440-02-0			---	2.0U	---	2.0U	---	2.0U	---	2.0U	---	**4.14**	---	**9.74**
POTASSIUM, DISSOLVED	7440-09-7			---	**11700**	---	**131000**	---	**249000**	---	**1080**	---	**1790**	---	**96600**
SELENIUM, DISSOLVED	7782-49-2	50	50	---	3.0U	---	3.0U	---	3.0U	---	3.0U	---	3.0U	---	3.0U
SILVER, DISSOLVED	7440-22-4			---	**0.067J**	---	0.4U	---	**0.071J**	---	0.4U	---	0.4U	---	0.4U
SODIUM, DISSOLVED	7440-23-5			---	**228000**	---	**3710000**	---	**6830000**	---	**8150**	---	**7210**	---	**2670000**
THALLIUM, DISSOLVED	7440-28-0	2	2	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	0.4U	---	**0.082J**
VANADIUM, DISSOLVED	7440-62-2			---	**2.3J**	---	4.0U	---	**5.93**	---	4.0U	---	4.0U	---	4.0U
ZINC, DISSOLVED	7440-66-6			---	**14**	---	**7.6J**	---	8.0U	---	**19**	---	**135**	---	**22**

Notes:
1. Groundwater data compared to EPA RSLs for Tap Water and EPA Maximum Contaminant Levels (MCLs)
2. Groundwater data are not factored into the ecological risk assessment.
EN = Essential Nutrient
NT = Not Tested
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds MCL or State Specifc Standard for GA Groundater

Table 5-13
Summary of Pore Water Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

	SAMPLE LOCATION		PW-101		PW-102			PW-103		PW-104		
		SAMPLE ID	PW-101A 1 - 11-28-2011	PW-101A 1 F - 11-28-2011	PW-102A 1 -11-28-2011	PW-102A-D 1 - 11-28-2011	PW-102A 1 F - 11-28-2011	PW-103A 1 - 11-28-2011	PW-103A 1 F - 11-28-2011	PW-104A 1 - 11-28-2011	104ADUP	PW-104A 1 F - 11-28-2011
		SAMPLE DATE	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11
		QC IDENTIFIER			DUPLICATE	DUPLICATE						
ANALYTE	**CAS**	**ECO**										
VOCs (µg/L)												
1,1,1,2-TETRACHLOROETHANE	630-20-6		1U	---	1U	1U	---	1U	---	1U	---	---
1,1,1-TRICHLOROETHANE	71-55-6	312	1U	---	1U	1U	---	1U	---	1U	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	90.2	0.5U	---	0.5U	0.5U	---	0.5U	---	0.5U	---	---
1,1,2-TRICHLORO-1,2,2-	76-13-1		---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	550	1U	---	1U	1U	---	1U	---	1U	---	---
1,1-DICHLOROETHANE	75-34-3		1U	---	1U	1U	---	1U	---	1U	---	---
1,1-DICHLOROETHENE	75-35-4	25	1U	---	1U	1U	---	1U	---	1U	---	---
1,1-DICHLOROPROPENE	563-58-6		2U	---	2U	2U	---	2U	---	2U	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	110	1U	---	1U	1U	---	1U	---	1U	---	---
1,2,3-TRICHLOROPROPANE	96-18-4		1U	---	1U	1U	---	1U	---	1U	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5.4	1U	---	1U	1U	---	1U	---	1U	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	19	1U	---	1U	1U	---	1U	---	1U	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8		5U	---	5U	5U	---	5U	---	5U	---	---
1,2-DIBROMOETHANE	106-93-4		1U	---	1U	1U	---	1U	---	1U	---	---
1,2-DICHLOROBENZENE	95-50-1		1U	---	1U	1U	---	1U	---	1U	---	---
1,2-DICHLOROETHANE	107-06-2	1130	1U	---	1U	1U	---	1U	---	1U	---	---
1,2-DICHLOROPROPANE	78-87-5	2400	1U	---	1U	1U	---	1U	---	1U	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8		1U	---	1U	1U	---	1U	---	1U	---	---
1,3-DICHLOROBENZENE	541-73-1	28.5	1U	---	1U	1U	---	1U	---	1U	---	---
1,3-DICHLOROPROPANE	142-28-9		1U	---	1U	1U	---	1U	---	1U	---	---
1,4-DICHLOROBENZENE	106-46-7	19.9	1U	---	1U	1U	---	1U	---	1U	---	---
2,2-DICHLOROPROPANE	594-20-7		1U	---	1U	1U	---	1U	---	1U	---	---
2-BUTANONE (MEK)	78-93-3		10U	---	10U	10U	---	10U	---	10U	---	---
2-CHLOROTOLUENE	95-49-8		1U	---	1U	1U	---	1U	---	1U	---	---
2-HEXANONE	591-78-6		10U	---	10U	10U	---	10U	---	10U	---	---
4-CHLOROTOLUENE	106-43-4		1U	---	1U	1U	---	1U	---	1U	---	---
4-ISOPROPYLTOLUENE	99-87-6		1U	---	1U	1U	---	1U	---	1U	---	---
4-METHYL-2-PENTANONE	108-10-1	123000	10U	---	10U	10U	---	10U	---	10U	---	---
ACETONE	67-64-1	1500	10U	---	10U	10U	---	10U	---	10U	---	---
BENZENE	71-43-2	110	1U	---	1U	1U	---	1U	---	1U	---	---
BROMOBENZENE	108-86-1		2U	---	2U	2U	---	2U	---	2U	---	---
BROMOMETHANE	74-83-9	120	2U	---	2U	2U	---	2U	---	2U	---	---
BROMOCHLOROMETHANE	74-97-5		1U	---	1U	1U	---	1U	---	1U	---	---
BROMODICHLOROMETHANE	75-27-4		0.6U	---	0.6U	0.6U	---	0.6U	---	0.6U	---	---
BROMOFORM	75-25-2	640	1U	---	1U	1U	---	1U	---	1U	---	---
CARBON DISULFIDE	75-15-0	0.92	1U	---	1U	1U	---	1U	---	1U	---	---
CARBON TETRACHLORIDE	56-23-5		1U	---	1U	1U	---	1U	---	1U	---	---
CHLOROBENZENE	108-90-7	25	1U	---	1U	1U	---	1U	---	1U	---	---
CHLOROETHANE	75-00-3		2U	---	2U	2U	---	2U	---	2U	---	---
CHLOROFORM	67-66-3	815	1U	---	1U	1U	---	1U	---	1U	---	---
CHLOROMETHANE	74-87-3	2700	2U	---	2U	2U	---	2U	---	2U	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	970	1U	---	1U	1U	---	1U	---	1U	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5		0.4U	---	0.4U	0.4U	---	0.4U	---	0.4U	---	---
DIBROMOCHLOROMETHANE	124-48-1		1U	---	1U	1U	---	1U	---	1U	---	---
DIBROMOMETHANE	74-95-3		1U	---	1U	1U	---	1U	---	1U	---	---
DICHLORODIFLUOROMETHANE	75-71-8		2U	---	2U	2U	---	2U	---	2U	---	---
DIISOPROPYL ETHER	108-20-3		---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	25	1U	---	1U	1U	---	1U	---	1U	---	---
HEXACHLOROBUTADIENE	87-68-3	0.3	0.6U	---	0.6U	0.6U	---	0.6U	---	0.6U	---	---
ISOPROPYLBENZENE	98-82-8	2.6	1U	---	1U	1U	---	1U	---	1UJ	---	---
METHYL BROMIDE	74-83-9	120	2U	---	2U	2U	---	2U	---	2U	---	---
METHYL TERT-BUTYL ETHER	1634-04-4		1U	---	1U	1U	---	1U	---	1U	---	---
METHYLENE CHLORIDE	75-09-2	2560	2U	---	2U	2U	---	2U	---	2U	---	---
NAPHTHALENE	91-20-3	1.1	1U	---	1U	1U	---	1U	---	1U	---	---
N-BUTYL BENZENE	104-51-8		1U	---	1U	1U	---	1U	---	1U	---	---
N-PROPYL BENZENE	103-65-1		1U	---	1U	1U	---	1U	---	1U	---	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6		1U	---	1U	1U	---	1U	---	1U	---	---
SEC-BUTYL BENZENE	135-98-8	110	1U	---	1U	1U	---	1U	---	1U	---	---
STYRENE	100-42-5	910	1U	---	1U	1U	---	1U	---	1U	---	---

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Table 5-13
Summary of Pore Water Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

	SAMPLE LOCATION		PW-101		PW-102			PW-103		PW-104		
		SAMPLE ID	PW-101A 1 - 11-28-2011	PW-101A 1 F - 11-28-2011	PW-102A 1 -11-28-2011	PW-102A-D 1 - 11-28-2011	PW-102A 1 F - 11-28-2011	PW-103A 1 - 11-28-2011	PW-103A 1 F - 11-28-2011	PW-104A 1 - 11-28-2011	104ADUP	PW-104A 1 F - 11-28-2011
		SAMPLE DATE	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11	28-Nov-11
		QC IDENTIFIER			DUPLICATE	DUPLICATE						
ANALYTE	**CAS**	**ECO**										
VOCs (µg/L)												
TERT-BUTYLBENZENE	98-06-6	110	1U	---	1U	1U	---	1U	---	1U	---	---
TETRACHLOROETHENE	127-18-4	45	1U	---	1U	1U	---	1U	---	1U	---	---
TETRAHYDROFURAN	109-99-9		---	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	2	1U	---	1U	1U	---	1U	---	1U	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	970	1U	---	1U	1U	---	1U	---	1U	---	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6		0.4U	---	0.4U	0.4U	---	0.4U	---	0.4U	---	---
TRICHLOROETHYLENE	79-01-6	21	1U	---	1U	1U	---	1U	---	1U	---	---
TRICHLOROFLUOROMETHANE	75-69-4		1U	---	1U	1U	---	1U	---	1U	---	---
VINYL CHLORIDE	75-01-4	930	1U	---	1U	1U	---	1U	---	1U	---	---
TOTAL XYLENES		13	1U	---	1U	1U	---	1U	---	1U	---	---
PCBs (µg/L)												
AROCLOR 1016	12674-11-2		0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	---	0.11U
AROCLOR 1221	11104-28-2		0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	---	0.11U
AROCLOR 1232	11141-16-5		0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	---	0.11U
AROCLOR 1242	53469-21-9		0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	---	0.11U
AROCLOR 1248	12672-29-6		0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	---	0.11U
AROCLOR 1254	11097-69-1		0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	---	0.11U
AROCLOR 1260	11096-82-5		0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	---	0.11U
AROCLOR 1262	37324-23-5		0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	---	0.11U
AROCLOR 126	11100-14-4		0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	---	0.11U
TOTAL PCBS	1336-36-3	0.03	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	0.11U	---	0.11U
METALS TOTAL (µg/L)												
ARSENIC	7440-38-2	36	2.5U	---	2.5U	**0.7J**	---	**3.3**	---	**3.3J**	**4.6J**	---
BARIUM	7440-39-3	4	**9.8J**	---	**19.1J**	**18.2J**	---	**8.4J**	---	**11.1J**	**10.5J**	---
CADMIUM	7440-43-9	1.13	0.12U	---	0.12U	0.12U	---	0.12U	---	**0.03J**	0.12UJ	---
CHROMIUM	7440-47-3	11	10U	---	10U	10U	---	**2.8J**	---	**3.8J**	**3.2J**	---
HEXAVALENT CHROMIUM	18540-29-9	11	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	4.83	2.5U	---	2.5U	2.5U	---	12.5U	---	12.5U	12.5U	---
MERCURY	7439-97-6	0.94	0.2U	---	0.2U	0.2U	---	0.2U	---	0.2U	0.2U	---
SELENIUM	7782-49-2	71	5UJ	---	0.7UJ	5UJ	---	3.1UJ	---	**5.8J**	**3.9J**	---
SILVER	7440-22-4	0.23	0.25U	---	0.25U	0.25U	---	0.25U	---	**0.51J**	0.25UJ	---
METALS DISSOLVED (µg/L)												
ARSENIC, DISSOLVED	7440-38-2	36	---	2.5U	---	---	2.5U	---	**2.2J**	---	---	**3.8**
BARIUM, DISSOLVED	7440-39-3	4	---	**9.4J**	---	---	**18.4J**	---	**8.3J**	---	---	**10.6J**
CADMIUM, DISSOLVED	7440-43-9	1.13	---	0.12U	---	---	0.12U	---	**0.04J**	---	---	0.12UJ
CHROMIUM, DISSOLVED	7440-47-3	11	---	10U	---	---	10U	---	**2.4J**	---	---	**3.4J**
HEXAVALENT CHROMIUM, DISSOLVED	18540-29-9	11	---	---	---	---	---	---	---	---	---	---
LEAD, DISSOLVED	7439-92-1	5.6	---	2.5U	---	---	2.5U	---	12.5U	---	---	12.5U
MERCURY, DISSOLVED	7439-97-6	0.94	---	0.20U	---	---	0.20U	---	0.20U	---	---	0.20U
SELENIUM, DISSOLVED	7782-49-2	71	---	5UJ	---	---	5UJ	---	3.8UJ	---	---	**4.4J**
SILVER, DISSOLVED	7440-22-4	0.23	---	0.25U	---	---	0.25U	---	0.25U	---	---	0.25U

Notes:
1. Porewater data not screened against human health risk-based criteria.
2. Ecological risk-based screening levels are selected from the following sources:
   a) USEPA chronic AWQC for aquatic life (EPA, 2020)
   b) EPA Region III BTAG surface water screening values (EPA, 2006)
   c) Secondary Chronic Values derived by the Oak Ridge National Laboratory (ORNL)
   See risk assessment for additional details.

--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Ecological Screening Limit

Table 5-13
Summary of Pore Water Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

	SAMPLE LOCATION		PW-105		PW-1	PW-1-2014						
		SAMPLE ID	PW-105A 1 - 11-28-2011	PW-105A 1 F - 11-28-2011	PW-1-102908	PW-1-A	PW-1-ADUP	PW-199-A	PW-1-A-F	PW-1-A-FDUP	PW-199-A-F	PW-1-AM
		SAMPLE DATE	28-Nov-11	28-Nov-11	29-Oct-08	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14
		QC IDENTIFIER				DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	
ANALYTE	**CAS**	**ECO**										
VOCs (µg/L)												
1,1,1,2-TETRACHLOROETHANE	630-20-6		1U	---	1U	0.5UJ	---	0.5UJ	---	---	---	0.25U
1,1,1-TRICHLOROETHANE	71-55-6	312	1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
1,1,2,2-TETRACHLOROETHANE	79-34-5	90.2	0.5U	---	0.5U	0.2U	---	0.2U	---	---	---	0.25U
1,1,2-TRICHLORO-1,2,2-	76-13-1		---	---	1U	---	---	---	---	---	---	0.25U
1,1,2-TRICHLOROETHANE	79-00-5	550	1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
1,1-DICHLOROETHANE	75-34-3		1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
1,1-DICHLOROETHENE	75-35-4	25	1U	---	1U	**0.4J**	---	0.5U	---	---	---	0.25U
1,1-DICHLOROPROPENE	563-58-6		2U	---	2U	0.5U	---	0.5U	---	---	---	0.25U
1,2,3-TRICHLOROBENZENE	87-61-6	110	1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
1,2,3-TRICHLOROPROPANE	96-18-4		1U	---	1U	0.5UJ	---	0.5UJ	---	---	---	0.25U
1,2,4-TRICHLOROBENZENE	120-82-1	5.4	1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
1,2,4-TRIMETHYLBENZENE	95-63-6	19	1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8		5U	---	5U	2U	---	2U	---	---	---	0.25U
1,2-DIBROMOETHANE	106-93-4		1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
1,2-DICHLOROBENZENE	95-50-1		1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
1,2-DICHLOROETHANE	107-06-2	1130	1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
1,2-DICHLOROPROPANE	78-87-5	2400	1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
1,3,5-TRIMETHYLBENZENE	108-67-8		1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
1,3-DICHLOROBENZENE	541-73-1	28.5	1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
1,3-DICHLOROPROPANE	142-28-9		1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
1,4-DICHLOROBENZENE	106-46-7	19.9	1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
2,2-DICHLOROPROPANE	594-20-7		1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
2-BUTANONE (MEK)	78-93-3		10U	---	25U	5U	---	5U	---	---	---	5U
2-CHLOROTOLUENE	95-49-8		1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
2-HEXANONE	591-78-6		10U	---	10U	5U	---	5U	---	---	---	2.5U
4-CHLOROTOLUENE	106-43-4		1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
4-ISOPROPYLTOLUENE	99-87-6		1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
4-METHYL-2-PENTANONE	108-10-1	123000	10U	---	25U	5U	---	5U	---	---	---	2.5U
ACETONE	67-64-1	1500	10U	---	25U	5U	---	10U	---	---	---	5U
BENZENE	71-43-2	110	1U	---	1U	**0.2J**	---	**0.2J**	---	---	---	**0.25J**
BROMOBENZENE	108-86-1		2U	---	2U	0.5U	---	0.5U	---	---	---	0.25U
BROMOMETHANE	74-83-9	120	2U	---	2U	1UJ	---	1UJ	---	---	---	0.59UJ
BROMOCHLOROMETHANE	74-97-5		1U	---	1U	0.5U	---	0.5U	---	---	---	0.5U
BROMODICHLOROMETHANE	75-27-4		0.6U	---	0.6U	0.2U	---	0.2U	---	---	---	0.25U
BROMOFORM	75-25-2	640	1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
CARBON DISULFIDE	75-15-0	0.92	1U	---	1U	**0.6J**	---	**0.5J**	---	---	---	0.25U
CARBON TETRACHLORIDE	56-23-5		1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
CHLOROBENZENE	108-90-7	25	1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
CHLOROETHANE	75-00-3		2U	---	2U	1U	---	1U	---	---	---	0.25U
CHLOROFORM	67-66-3	815	1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
CHLOROMETHANE	74-87-3	2700	2U	---	2U	0.5U	---	0.5U	---	---	---	0.25U
CIS-1,2-DICHLOROETHENE	156-59-2	970	1U	---	1U	**35.2J**	---	**34.5J**	---	---	---	**36**
CIS-1,3-DICHLOROPROPENE	10061-01-5		0.4U	---	0.4U	0.2U	---	0.2U	---	---	---	0.25UJ
DIBROMOCHLOROMETHANE	124-48-1		1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
DIBROMOMETHANE	74-95-3		1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
DICHLORODIFLUOROMETHANE	75-71-8		2U	---	2U	1U	---	1U	---	---	---	0.25U
DIISOPROPYL ETHER	108-20-3		---	---	---	---	---	---	---	---	---	0.25U
ETHYLBENZENE	100-41-4	25	1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
HEXACHLOROBUTADIENE	87-68-3	0.3	0.6U	---	0.6U	0.5U	---	0.5U	---	---	---	0.25U
ISOPROPYLBENZENE	98-82-8	2.6	1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
METHYL BROMIDE	74-83-9	120	2U	---	2U	1UJ	---	1UJ	---	---	---	0.59UJ
METHYL TERT-BUTYL ETHER	1634-04-4		1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
METHYLENE CHLORIDE	75-09-2	2560	2U	---	4U	0.5U	---	0.5U	---	---	---	0.25U
NAPHTHALENE	91-20-3	1.1	1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
N-BUTYL BENZENE	104-51-8		1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
N-PROPYL BENZENE	103-65-1		1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6		1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
SEC-BUTYL BENZENE	135-98-8	110	1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
STYRENE	100-42-5	910	1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U

Table 5-13
Summary of Pore Water Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

	SAMPLE LOCATION		PW-105		PW-1	PW-1-2014						
		SAMPLE ID	PW-105A 1 - 11-28-2011	PW-105A 1 F - 11-28-2011	PW-1-102908	PW-1-A	PW-1-ADUP	PW-199-A	PW-1-A-F	PW-1-A-FDUP	PW-199-A-F	PW-1-AM
		SAMPLE DATE	28-Nov-11	28-Nov-11	29-Oct-08	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14
		QC IDENTIFIER				DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	
ANALYTE	**CAS**	**ECO**										
VOCs (µg/L)												
TERT-BUTYLBENZENE	98-06-6	110	1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
TETRACHLOROETHENE	127-18-4	45	1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
TETRAHYDROFURAN	109-99-9		---	---	5U	---	---	---	---	---	---	2.5U
TOLUENE	108-88-3	2	1U	---	1U	0.2U	---	0.2U	---	---	---	0.25U
TRANS-1,2-DICHLOROETHENE	156-60-5	970	1U	---	1U	**1.3**	---	**1.2**	---	---	---	**1.4**
TRANS-1,3-DICHLOROPROPENE	10061-02-6		0.4U	---	0.5U	0.2U	---	0.2U	---	---	---	0.25UJ
TRICHLOROETHYLENE	79-01-6	21	1U	---	1U	**2.0**	---	**2.0**	---	---	---	**2.3**
TRICHLOROFLUOROMETHANE	75-69-4		1U	---	1U	0.5U	---	0.5U	---	---	---	0.25U
VINYL CHLORIDE	75-01-4	930	1U	---	1U	**7.7**	---	**7.1**	---	---	---	**8.9**
TOTAL XYLENES		13	1U	---	1U	**0.1J**	---	**0.1J**	---	---	---	**0.08J**
PCBs (µg/L)												
AROCLOR 1016	12674-11-2		0.11U	0.11U	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2		0.11U	0.11U	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5		0.11U	0.11U	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9		0.11U	0.11U	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6		0.11U	0.11U	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1		0.11U	0.11U	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5		0.11U	0.11U	---	---	---	---	---	---	---	---
AROCLOR 1262	37324-23-5		0.11U	0.11U	---	---	---	---	---	---	---	---
AROCLOR 126	11100-14-4		0.11U	0.11U	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	0.03	0.11U	0.11U	---	---	---	---	---	---	---	---
METALS TOTAL (µg/L)												
ARSENIC	7440-38-2	36	**0.4J**	---	---	1U	1U	1U	---	---	---	---
BARIUM	7440-39-3	4	**9.3J**	---	---	**67.2**	**65.6**	**68.3**	---	---	---	---
CADMIUM	7440-43-9	1.13	0.12U	---	---	**0.04J**	0.1UJ	0.1UJ	---	---	---	---
CHROMIUM	7440-47-3	11	**4.8J**	---	---	3U	3U	3U	---	---	---	---
HEXAVALENT CHROMIUM	18540-29-9	11	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	4.83	12.5U	---	---	1.0U	1.0U	1.0U	---	---	---	---
MERCURY	7439-97-6	0.94	0.2U	---	---	0.2UJ	0.2U	0.2UJ	---	---	---	---
SELENIUM	7782-49-2	71	**9.4J**	---	---	2U	2U	2U	---	---	---	---
SILVER	7440-22-4	0.23	0.25U	---	---	0.1UJ	0.1U	0.1UJ	---	---	---	---
METALS DISSOLVED (µg/L)												
ARSENIC, DISSOLVED	7440-38-2	36	---	**4.5**	---	---	---	---	1U	1U	1U	---
BARIUM, DISSOLVED	7440-39-3	4	---	**9.6J**	---	---	---	---	**69.3**	**68.0**	**66.4**	---
CADMIUM, DISSOLVED	7440-43-9	1.13	---	**0.24J**	---	---	---	---	0.10UJ	0.10U	0.10UJ	---
CHROMIUM, DISSOLVED	7440-47-3	11	---	**4.5J**	---	---	---	---	3.0U	3.0U	3.0U	---
HEXAVALENT CHROMIUM, DISSOLVED	18540-29-9	11	---	---	---	---	---	---	---	---	---	---
LEAD, DISSOLVED	7439-92-1	5.6	---	12.5U	---	---	---	---	1.0U	1.0U	1.0U	---
MERCURY, DISSOLVED	7439-97-6	0.94	---	0.20U	---	---	---	---	0.20UJ	0.20U	0.20UJ	---
SELENIUM, DISSOLVED	7782-49-2	71	---	**14.2J**	---	---	---	---	2.0U	2.0U	2.0U	---
SILVER, DISSOLVED	7440-22-4	0.23	---	0.25U	---	---	---	---	0.10UJ	0.10UJ	0.10UJ	---

Notes:
1. Porewater data not screened against human health risk-based criteria.
2. Ecological risk-based screening levels are selected from the following source
a) USEPA chronic AWQC for aquatic life (EPA, 2020)
b) EPA Region III BTAG surface water screening values (EPA, 2006)
c) Secondary Chronic Values derived by the Oak Ridge National Laboratory (C
See risk assessment for additional details.
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Ecological Screening Limit

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Table 5-13
Summary of Pore Water Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

		SAMPLE LOCATION	PW-2-2014			PW-3-2014			PW-4-2014			PW-5-2014			PW-C	PW-E	PW-F		PW-H	PW-I	PW-TS1A	PW-TS1C
		SAMPLE ID	PW-2-A	PW-2-A-F	PW-2-AM	PW-3-A	PW-3-A-F	PW-3-AM	PW-4-A	PW-4-A-F	PW-4-AM	PW-5-A	PW-5-A-F	PW-5-AM	PW-C-AM	PW-E-AM	PW-F-AM	PW-F-AM-DUP	PW-H-AM	PW-I-AM	PW-TS1A-AM	PW-TS1C-AM
		SAMPLE DATE	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14	29-Jul-14	29-Jul-14	29-Jul-14	29-Jul-14	29-Jul-14	29-Jul-14	04-Aug-14	04-Aug-14	04-Aug-14	04-Aug-14	04-Aug-14	04-Aug-14	04-Aug-14	04-Aug-14
		QC IDENTIFIER																				
ANALYTE	**CAS**	**ECO**																				
VOCs (µg/L)																						
1,1,1,2-TETRACHLOROETHANE	630-20-6		0.5UJ	---	0.25U	0.5UJ	---	0.25U	0.5UJ	---	0.25U	0.5UJ	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,1,1-TRICHLOROETHANE	71-55-6	312	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,1,2,2-TETRACHLOROETHANE	79-34-5	90.2	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	**0.16J**	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,1,2-TRICHLORO-1,2,2-	76-13-1		---	---	0.25U	---	---	0.25U	---	---	0.25U	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,1,2-TRICHLOROETHANE	79-00-5	550	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,1-DICHLOROETHANE	75-34-3		0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,1-DICHLOROETHENE	75-35-4	25	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,1-DICHLOROPROPENE	563-58-6		0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,2,3-TRICHLOROBENZENE	87-61-6	110	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,2,3-TRICHLOROPROPANE	96-18-4		0.5UJ	---	0.25U	0.5UJ	---	0.25U	0.5UJ	---	0.25U	0.5UJ	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,2,4-TRICHLOROBENZENE	120-82-1	5.4	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,2,4-TRIMETHYLBENZENE	95-63-6	19	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8		2U	---	0.25U	2U	---	0.25U	2U	---	0.25U	2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,2-DIBROMOETHANE	106-93-4		0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,2-DICHLOROBENZENE	95-50-1		0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,2-DICHLOROETHANE	107-06-2	1130	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,2-DICHLOROPROPANE	78-87-5	2400	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,3,5-TRIMETHYLBENZENE	108-67-8		0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,3-DICHLOROBENZENE	541-73-1	28.5	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,3-DICHLOROPROPANE	142-28-9		0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
1,4-DICHLOROBENZENE	106-46-7	19.9	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
2,2-DICHLOROPROPANE	594-20-7		0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
2-BUTANONE (MEK)	78-93-3		5U	---	5U	5U	---	5U	5U	---	5U	5U	---	5U	5U	5U	5U	5U	5U	5U	5U	5U
2-CHLOROTOLUENE	95-49-8		0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25UJ	0.2U	---	0.25UJ	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
2-HEXANONE	591-78-6		5U	---	2.5U	5U	---	2.5U	5U	---	2.5U	5U	---	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U
4-CHLOROTOLUENE	106-43-4		0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25UJ	0.2U	---	0.25UJ	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
4-ISOPROPYLTOLUENE	99-87-6		0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
4-METHYL-2-PENTANONE	108-10-1	123000	5U	---	2.5U	5U	---	2.5U	5U	---	2.5U	5U	---	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U
ACETONE	67-64-1	1500	5U	---	5U	5U	---	5U	5U	---	5U	**5.2J**	---	**4.3J**	5U	5U	5U	5U	5U	**4.4J**	5U	5U
BENZENE	71-43-2	110	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	**0.13J**	0.25U	0.25U
BROMOBENZENE	108-86-1		0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
BROMOMETHANE	74-83-9	120	1UJ	---	0.59UJ	1UJ	---	0.59UJ	1UJ	---	0.59U	1UJ	---	0.59U	0.59U	0.59U	0.59U	0.59U	0.59U	0.59U	0.59U	0.59U
BROMOCHLOROMETHANE	74-97-5		0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	---	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U
BROMODICHLOROMETHANE	75-27-4		0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
BROMOFORM	75-25-2	640	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
CARBON DISULFIDE	75-15-0	0.92	**1.1**	---	0.25U	**0.6J**	---	0.25U	**0.4J**	---	**0.94**	**0.2J**	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
CARBON TETRACHLORIDE	56-23-5		0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
CHLOROBENZENE	108-90-7	25	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
CHLOROETHANE	75-00-3		1U	---	0.25U	1U	---	0.25U	1U	---	0.25U	1U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
CHLOROFORM	67-66-3	815	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
CHLOROMETHANE	74-87-3	2700	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
CIS-1,2-DICHLOROETHENE	156-59-2	970	0.5UJ	---	0.25U	0.5UJ	---	0.25U	0.5UJ	---	0.25U	0.5UJ	---	0.25U	0.25U	0.25U	0.25U	0.25U	**1.7**	0.25U	0.25U	0.25U
CIS-1,3-DICHLOROPROPENE	10061-01-5		0.2U	---	0.25UJ	0.2U	---	0.25UJ	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
DIBROMOCHLOROMETHANE	124-48-1		0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
DIBROMOMETHANE	74-95-3		0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
DICHLORODIFLUOROMETHANE	75-71-8		1U	---	0.25U	1U	---	0.25U	1U	---	0.25U	1U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
DIISOPROPYL ETHER	108-20-3		---	---	0.25U	---	---	0.25U	---	---	0.25U	---	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
ETHYLBENZENE	100-41-4	25	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
HEXACHLOROBUTADIENE	87-68-3	0.3	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
ISOPROPYLBENZENE	98-82-8	2.6	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	**0.76**	0.25U	0.25U	0.25U
METHYL BROMIDE	74-83-9	120	1UJ	---	0.59UJ	1UJ	---	0.59UJ	1UJ	---	0.59U	1UJ	---	0.59U	0.59U	0.59U	0.59U	0.59U	0.59U	0.59U	0.59U	0.59U
METHYL TERT-BUTYL ETHER	1634-04-4		0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
METHYLENE CHLORIDE	75-09-2	2560	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
NAPHTHALENE	91-20-3	1.1	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
N-BUTYL BENZENE	104-51-8		0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
N-PROPYL BENZENE	103-65-1		0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25UJ	0.5U	---	0.25UJ	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6		0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
SEC-BUTYL BENZENE	135-98-8	110	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25UJ	0.2U	---	0.25UJ	0.25U	0.25U	0.25U	0.25U	**1.7**	**5**	0.25U	0.25U
STYRENE	100-42-5	910	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U

Table 5-13
Summary of Pore Water Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

	SAMPLE LOCATION		PW-2-2014			PW-3-2014			PW-4-2014			PW-5-2014			PW-C	PW-E	PW-F		PW-H	PW-I	PW-TS1A	PW-TS1C
	SAMPLE ID		PW-2-A	PW-2-A-F	PW-2-AM	PW-3-A	PW-3-A-F	PW-3-AM	PW-4-A	PW-4-A-F	PW-4-AM	PW-5-A	PW-5-A-F	PW-5-AM	PW-C-AM	PW-E-AM	PW-F-AM	PW-F-AM-DUP	PW-H-AM	PW-I-AM	PW-TS1A-AM	PW-TS1C-AM
	SAMPLE DATE		30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14	30-Jul-14	29-Jul-14	29-Jul-14	29-Jul-14	29-Jul-14	29-Jul-14	29-Jul-14	04-Aug-14	04-Aug-14	04-Aug-14	04-Aug-14	04-Aug-14	04-Aug-14	04-Aug-14	04-Aug-14
	QC IDENTIFIER																					
ANALYTE	**CAS**	**ECO**																				
VOCs (µg/L)																						
TERT-BUTYLBENZENE	98-06-6	110	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	**0.81**	**4.5**	0.25U	0.25U
TETRACHLOROETHENE	127-18-4	45	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
TETRAHYDROFURAN	109-99-9		---	---	2.5U	---	---	2.5U	---	---	2.5U	---	---	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U
TOLUENE	108-88-3	2	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	**2.8**	0.25U	0.25U
TRANS-1,2-DICHLOROETHENE	156-60-5	970	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
TRANS-1,3-DICHLOROPROPENE	10061-02-6		0.2U	---	0.25UJ	0.2U	---	0.25UJ	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
TRICHLOROETHYLENE	79-01-6	21	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	**0.12J**	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	**7.4**	0.25U	0.25U	0.25U
TRICHLOROFLUOROMETHANE	75-69-4		0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
VINYL CHLORIDE	75-01-4	930	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.5U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
TOTAL XYLENES		13	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.2U	---	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U	0.25U
PCBs (µg/L)																						
AROCLOR 1016	12674-11-2		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1221	11104-28-2		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1232	11141-16-5		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1242	53469-21-9		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1248	12672-29-6		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1254	11097-69-1		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1260	11096-82-5		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 1262	37324-23-5		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
AROCLOR 126	11100-14-4		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL PCBS	1336-36-3	0.03	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
METALS TOTAL (µg/L)																						
ARSENIC	7440-38-2	36	**14.9**	---	---	**3.5**	---	---	**6.8**	---	---	1U	---	---	---	---	---	---	---	---	---	---
BARIUM	7440-39-3	4	**13.4J**	---	---	**18.4J**	---	---	**18.0J**	---	---	**18.4J**	---	---	---	---	---	---	---	---	---	---
CADMIUM	7440-43-9	1.13	0.1UJ	---	---	0.3UJ	---	---	0.1UJ	---	---	0.1UJ	---	---	---	---	---	---	---	---	---	---
CHROMIUM	7440-47-3	11	**2.2J**	---	---	**2.1J**	---	---	**1.6J**	---	---	**2.3J**	---	---	---	---	---	---	---	---	---	---
HEXAVALENT CHROMIUM	18540-29-9	11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	4.83	**0.8J**	---	---	2U	---	---	1U	---	---	2U	---	---	---	---	---	---	---	---	---	---
MERCURY	7439-97-6	0.94	0.2UJ	---	---	0.2UJ	---	---	0.2UJ	---	---	0.2UJ	---	---	---	---	---	---	---	---	---	---
SELENIUM	7782-49-2	71	2U	---	---	2U	---	---	2U	---	---	4U	---	---	---	---	---	---	---	---	---	---
SILVER	7440-22-4	0.23	0.1UJ	---	---	0.3UJ	---	---	0.3UJ	---	---	0.3UJ	---	---	---	---	---	---	---	---	---	---
METALS DISSOLVED (µg/L)																						
ARSENIC, DISSOLVED	7440-38-2	36	---	**12.6**	---	---	**3.7**	---	---	**6.1J**	---	---	3U	---	---	---	---	---	---	---	---	---
BARIUM, DISSOLVED	7440-39-3	4	---	**13.6J**	---	---	**19.0J**	---	---	**17.6J**	---	---	**18.2J**	---	---	---	---	---	---	---	---	---
CADMIUM, DISSOLVED	7440-43-9	1.13	---	**0.09J**	---	---	**0.08J**	---	---	0.30UJ	---	---	0.30UJ	---	---	---	---	---	---	---	---	---
CHROMIUM, DISSOLVED	7440-47-3	11	---	**2.4J**	---	---	**2.1J**	---	---	**2.2J**	---	---	**2.3J**	---	---	---	---	---	---	---	---	---
HEXAVALENT CHROMIUM, DISSOLVED	18540-29-9	11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LEAD, DISSOLVED	7439-92-1	5.6	---	2.0U	---	---	**19.6**	---	---	2.0U	---	---	2.0U	---	---	---	---	---	---	---	---	---
MERCURY, DISSOLVED	7439-97-6	0.94	---	0.20UJ	---	---	0.20UJ	---	---	0.20UJ	---	---	0.20UJ	---	---	---	---	---	---	---	---	---
SELENIUM, DISSOLVED	7782-49-2	71	---	2.0U	---	---	2.0U	---	---	**2.7J**	---	---	2.0U	---	---	---	---	---	---	---	---	---
SILVER, DISSOLVED	7440-22-4	0.23	---	0.30UJ	---	---	0.30UJ	---	---	0.30UJ	---	---	0.50UJ	---	---	---	---	---	---	---	---	---

Notes:
1. Porewater data not screened against human health risk-based criteria.
2. Ecological risk-based screening levels are selected from the following source
   a) USEPA chronic AWQC for aquatic life (EPA, 2020)
   b) EPA Region III BTAG surface water screening values (EPA, 2006)
   c) Secondary Chronic Values derived by the Oak Ridge National Laboratory (C
   See risk assessment for additional details.
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Ecological Screening Limit

Table 5-14
Summary of Pore Water Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

		SAMPLE LOCATION	PW-2	PW-3	PW-4	PW-5	PW-OFF-1		PW-OFF-2		PW-OFF-3		PW-OFF-4		PW-OFF-5	
		SAMPLE ID	PW-2-102908	PW-3-102908	PW-4-102908	PW-5-102908	PW-OFF-1-083115	PW-OFF-1F-083115	PW-OFF-2-083115	PW-OFF-2F-083115	PW-OFF-3-083115	PW-OFF-3F-083115	PW-OFF-4-083115	PW-OFF-4F-083115	PW-OFF-5-083115	PW-OFF-5F-083115
		SAMPLE DATE	29-Oct-08	29-Oct-08	29-Oct-08	29-Oct-08	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15
		QC IDENTIFIER														
ANALYTE	**CAS**	**ECO**														
VOCs (µg/L)																
1,1,1,2-TETRACHLOROETHANE	630-20-6		1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,1,1-TRICHLOROETHANE	71-55-6	312	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	90.2	0.5U	0.5U	0.5U	0.5U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,1,2-TRICHLORO-1,2,2-	76-13-1		---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	550	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,1-DICHLOROETHANE	75-34-3		1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,1-DICHLOROETHENE	75-35-4	2240	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,1-DICHLOROPROPENE	563-58-6		1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,2,3-TRICHLOROBENZENE	87-61-6	110	1.0U	1.0U	1.0U	1.0U	20U	---	20U	---	20U	---	20U	---	20U	---
1,2,3-TRICHLOROPROPANE	96-18-4		1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
1,2,4-TRICHLOROBENZENE	120-82-1	5.4	1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
1,2,4-TRIMETHYLBENZENE	95-63-6	19	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8		5.0U	5.0U	5.0U	5.0U	10U	---	10U	---	10U	---	10U	---	10U	---
1,2-DIBROMOETHANE	106-93-4		1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
1,2-DICHLOROBENZENE	95-50-1		1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,2-DICHLOROETHANE	107-06-2	1130	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,2-DICHLOROPROPANE	78-87-5	2400	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,3,5-TRIMETHYLBENZENE	108-67-8		1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,3-DICHLOROBENZENE	541-73-1	28.5	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,3-DICHLOROPROPANE	142-28-9		1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
1,4-DICHLOROBENZENE	106-46-7	19.9	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
2,2-DICHLOROPROPANE	594-20-7		1.0U	1.0U	1.0U	1.0U	20U	---	20U	---	20U	---	20U	---	20U	---
2-BUTANONE (MEK)	78-93-3		25U	25U	25U	25U	50U	---	50U	---	50U	---	50U	---	50U	---
2-CHLOROTOLUENE	95-49-8		1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
2-HEXANONE	591-78-6		10U	10U	10U	10U	50U	---	50U	---	50U	---	50U	---	50U	---
4-CHLOROTOLUENE	106-43-4		1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
4-ISOPROPYLTOLUENE	99-87-6		1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
4-METHYL-2-PENTANONE	108-10-1	123000	25U	25U	25U	25U	20U	---	20U	---	20U	---	20U	---	20U	---
ACETONE	67-64-1	564000	25U	25U	25U	25U	50U	---	50U	---	50U	---	50U	---	50U	---
BENZENE	71-43-2	110	1.0U	1.0U	1.0U	1.0U	5U	---	5U	---	5U	---	5U	---	5.0U	---
BROMOBENZENE	108-86-1		2.0U	2.0U	2.0U	2.0U	10U	---	10U	---	10U	---	10U	---	10U	---
BROMOMETHANE	74-83-9	120	2.0U	2.0U	2.0U	2.0U	10U	---	10U	---	10U	---	10U	---	10U	---
BROMOCHLOROMETHANE	74-97-5		1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
BROMODICHLOROMETHANE	75-27-4		0.6U	0.6U	0.6U	0.6U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
BROMOFORM	75-25-2	640	1.0U	1.0U	1U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CARBON DISULFIDE	75-15-0	0.92	1.0U	1.0U	1U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CARBON TETRACHLORIDE	56-23-5		1.0U	1.0U	1U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CHLOROBENZENE	108-90-7	25	1.0U	1.0U	1U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CHLOROETHANE	75-00-3		2.0U	2.0U	2.0U	2.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CHLOROFORM	67-66-3	815	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CHLOROMETHANE	74-87-3	2700	2.0U	2.0U	2.0U	2.0U	10U	---	10U	---	10U	---	10U	---	10U	---
CIS-1,2-DICHLOROETHENE	156-59-2	970	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CIS-1,3-DICHLOROPROPENE	10061-01-5		0.4U	0.4U	0.4U	0.4U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
DIBROMOCHLOROMETHANE	124-48-1		1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
DIBROMOMETHANE	74-95-3		1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
DICHLORODIFLUOROMETHANE	75-71-8		2.0U	2.0U	2.0U	2.0U	10U	---	10U	---	10U	---	10U	---	10U	---
DIISOPROPYL ETHER	108-20-3		---	---	---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	25	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
HEXACHLOROBUTADIENE	87-68-3	0.3	0.6U	0.6U	0.6U	0.6U	10U	---	10U	---	10U	---	10U	---	10U	---
ISOPROPYLBENZENE	98-82-8	110	1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
METHYL BROMIDE	74-83-9	120	2.0U	2.0U	2.0U	2.0U	---	---	---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4		1.0U	1.0U	1.0U	1.0U	5U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
METHYLENE CHLORIDE	75-09-2	2560	4U	4U	4U	4U	10U	---	10U	---	10U	---	10U	---	10U	---
NAPHTHALENE	91-20-3	1.4	1.0U	1.0U	1.0U	1.0U	20U	---	20U	---	20U	---	20U	---	20U	---
N-BUTYL BENZENE	104-51-8		1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
N-PROPYL BENZENE	103-65-1		1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6		1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
SEC-BUTYL BENZENE	135-98-8	110	1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
STYRENE	100-42-5	910	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---

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Table 5-14
Summary of Pore Water Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

		SAMPLE LOCATION	PW-2	PW-3	PW-4	PW-5	PW-OFF-1		PW-OFF-2		PW-OFF-3		PW-OFF-4		PW-OFF-5	
		SAMPLE ID	PW-2-102908	PW-3-102908	PW-4-102908	PW-5-102908	PW-OFF-1-083115	PW-OFF-1F-083115	PW-OFF-2-083115	PW-OFF-2F-083115	PW-OFF-3-083115	PW-OFF-3F-083115	PW-OFF-4-083115	PW-OFF-4F-083115	PW-OFF-5-083115	PW-OFF-5F-083115
		SAMPLE DATE	29-Oct-08	29-Oct-08	29-Oct-08	29-Oct-08	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15	31-Aug-15
		QC IDENTIFIER														
ANALYTE	**CAS**	**ECO**														
VOCs (µg/L)																
TERT-BUTYLBENZENE	98-06-6	110	1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
TETRACHLOROETHENE	127-18-4	45	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TETRAHYDROFURAN	109-99-9		5.0U	5.0U	5.0U	5.0U	---	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	215	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TRANS-1,2-DICHLOROETHENE	156-60-5	970	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6		0.5U	0.5U	0.5U	0.5U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TRICHLOROETHYLENE	79-01-6	21	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TRICHLOROFLUOROMETHANE	75-69-4		1.0U	1.0U	1.0U	1.0U	10U	---	10U	---	10U	---	10U	---	10U	---
VINYL CHLORIDE	75-01-4	930	1.0U	1.0U	1.0U	1.0U	5.0U	---	5.0U	---	5U	---	5.0U	---	5.0U	---
TOTAL XYLENES		19	3.0U	3.0U	3.0U	3.0U	15U	---	15U	---	15U	---	15U	---	15U	---
METALS TOTAL (µg/L)																
ARSENIC	7440-38-2	36	---	---	---	---	4.0U	---	4.0U	---	**4.6J**	---	4.0U	---	4.0U	---
BARIUM	7440-39-3	4	---	---	---	---	25U	---	25U	---	25U	---	**33.9J**	---	25U	---
CADMIUM	7440-43-9	7.9	---	---	---	---	4.0U	---	4.0U	---	4.0U	---	4.0U	---	4.0U	---
CHROMIUM	7440-47-3		---	---	---	---	10U	---	25U	---	25U	---	**14.4J**	---	25U	---
HEXAVALENT CHROMIUM	18540-29-9	50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	5.6	---	---	---	---	13U	---	13U	---	13U	---	13U	---	13U	---
MERCURY	7439-97-6	0.94	---	---	---	---	0.15U	---	0.15U	---	0.15U	---	0.15U	---	0.15U	---
SELENIUM	7782-49-2	71	---	---	---	---	10U	---	10U	---	10U	---	10U	---	10U	---
SILVER	7440-22-4	0.23	---	---	---	---	13U	---	13U	---	13U	---	5U	---	13U	---
METALS DISSOLVED (µg/L)																
ARSENIC, DISSOLVED	7440-38-2	36	---	---	---	---	---	4.0U	---	4.0U	---	10U	---	10U	---	4.0U
BARIUM, DISSOLVED	7440-39-3	4	---	---	---	---	---	25U	---	25U	---	25U	---	25U	---	25U
CADMIUM, DISSOLVED	7440-43-9	7.9	---	---	---	---	---	4.0U	---	4.0U	---	10U	---	10U	---	4.0U
CHROMIUM, DISSOLVED	7440-47-3		---	---	---	---	---	25U	---	25U	---	25U	---	25U	---	25U
HEXAVALENT CHROMIUM, DISSOLVED	18540-29-9	50	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LEAD, DISSOLVED	7439-92-1	5.6	---	---	---	---	---	13U	---	13U	---	13U	---	13U	---	13U
MERCURY, DISSOLVED	7439-97-6	0.94	---	---	---	---	---	0.15U	---	0.15U	---	0.15U	---	0.15U	---	0.15U
SELENIUM, DISSOLVED	7782-49-2	71	---	---	---	---	---	10U	---	10U	---	25U	---	25U	---	10U
SILVER, DISSOLVED	7440-22-4	0.23	---	---	---	---	---	13U	---	13U	---	13U	---	13U	---	13U

Notes:
1. Porewater data not screened against human health risk-based criteria.
2. Ecological risk-based screening levels are selected from the following sources:
   a) USEPA chronic AWQC for aquatic life (EPA, 2020)
   b) EPA Region III BTAG surface water screening values (EPA, 2006)
   c) Secondary Chronic Values derived by the Oak Ridge National Laboratory (ORNL)
   See risk assessment for additional details.
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of
Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Ecological Screening Limit

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Table 5-14
Summary of Pore Water Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

		SAMPLE LOCATION	PW-OFF-6		PW-OFF-7		PW-OFF-8		PW-OFF-9		PW-OFF-10			
		SAMPLE ID	PW-OFF-6-083115	PW-OFF-6F-083115	PW-OFF-7-090115	PW-OFF-7F-090115	PW-OFF-8-090115	PW-OFF-8F-090115	PW-OFF-9-090115	PW-OFF-9F-090115	PW-OFF-10-09115	PW-OFF-10X-09115	PW-OFF-10F-09115	PW-OFF-10XF-09115
		SAMPLE DATE	31-Aug-15	31-Aug-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15
		QC IDENTIFIER									DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE
ANALYTE	**CAS**	**ECO**												
VOCs (µg/L)														
1,1,1,2-TETRACHLOROETHANE	630-20-6		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,1,1-TRICHLOROETHANE	71-55-6	312	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	90.2	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,1,2-TRICHLORO-1,2,2-	76-13-1		---	---	---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	550	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,1-DICHLOROETHANE	75-34-3		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,1-DICHLOROETHENE	75-35-4	2240	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,1-DICHLOROPROPENE	563-58-6		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	110	20U	---	20U	---	20U	---	20U	---	20U	---	---	---
1,2,3-TRICHLOROPROPANE	96-18-4		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5.4	10U	---	10U	---	10U	---	10U	---	10U	---	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	19	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
1,2-DIBROMOETHANE	106-93-4		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
1,2-DICHLOROBENZENE	95-50-1		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,2-DICHLOROETHANE	107-06-2	1130	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,2-DICHLOROPROPANE	78-87-5	2400	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,3-DICHLOROBENZENE	541-73-1	28.5	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
1,3-DICHLOROPROPANE	142-28-9		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
1,4-DICHLOROBENZENE	106-46-7	19.9	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
2,2-DICHLOROPROPANE	594-20-7		20U	---	20U	---	20U	---	20U	---	20U	---	---	---
2-BUTANONE (MEK)	78-93-3		50U	---	50U	---	50U	---	50U	---	50U	---	---	---
2-CHLOROTOLUENE	95-49-8		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
2-HEXANONE	591-78-6		50U	---	50U	---	50U	---	50U	---	50U	---	---	---
4-CHLOROTOLUENE	106-43-4		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
4-ISOPROPYLTOLUENE	99-87-6		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
4-METHYL-2-PENTANONE	108-10-1	123000	20U	---	20U	---	20U	---	20U	---	20U	---	---	---
ACETONE	67-64-1	564000	50U	---	50U	---	50U	---	50U	---	50U	---	---	---
BENZENE	71-43-2	110	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5U	---	---	---
BROMOBENZENE	108-86-1		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
BROMOMETHANE	74-83-9	120	10U	---	10U	---	10U	---	10U	---	10U	---	---	---
BROMOCHLOROMETHANE	74-97-5		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5U	---	---	---
BROMODICHLOROMETHANE	75-27-4		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5U	---	---	---
BROMOFORM	75-25-2	640	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5U	---	---	---
CARBON DISULFIDE	75-15-0	0.92	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
CARBON TETRACHLORIDE	56-23-5		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
CHLOROBENZENE	108-90-7	25	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
CHLOROETHANE	75-00-3		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
CHLOROFORM	67-66-3	815	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
CHLOROMETHANE	74-87-3	2700	10U	---	10U	---	10U	---	10U	---	10U	---	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	970	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
DIBROMOCHLOROMETHANE	124-48-1		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
DIBROMOMETHANE	74-95-3		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
DICHLORODIFLUOROMETHANE	75-71-8		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
DIISOPROPYL ETHER	108-20-3		---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	25	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
HEXACHLOROBUTADIENE	87-68-3	0.3	10U	---	10U	---	10U	---	10U	---	10U	---	---	---
ISOPROPYLBENZENE	98-82-8	110	10U	---	10U	---	10U	---	10U	---	10U	---	---	---
METHYL BROMIDE	74-83-9	120	---	---	---	---	---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
METHYLENE CHLORIDE	75-09-2	2560	10U	---	10U	---	10U	---	10U	---	1.0U	---	---	---
NAPHTHALENE	91-20-3	1.4	20U	---	20U	---	20U	---	20U	---	10U	---	---	---
N-BUTYL BENZENE	104-51-8		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
N-PROPYL BENZENE	103-65-1		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
SEC-BUTYL BENZENE	135-98-8	110	10U	---	10U	---	10U	---	10U	---	10U	---	---	---
STYRENE	100-42-5	910	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---

Table 5-14
Summary of Pore Water Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

		SAMPLE LOCATION	PW-OFF-6		PW-OFF-7		PW-OFF-8		PW-OFF-9		PW-OFF-10			
		SAMPLE ID	PW-OFF-6-083115	PW-OFF-6F-083115	PW-OFF-7-090115	PW-OFF-7F-090115	PW-OFF-8-090115	PW-OFF-8F-090115	PW-OFF-9-090115	PW-OFF-9F-090115	PW-OFF-10-09115	PW-OFF-10X-09115	PW-OFF-10F-09115	PW-OFF-10XF-09115
		SAMPLE DATE	31-Aug-15	31-Aug-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15
		QC IDENTIFIER									DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE
ANALYTE	**CAS**	**ECO**												
VOCs (µg/L)														
TERT-BUTYLBENZENE	98-06-6	110	10U	---	10U	---	10U	---	10U	---	10U	---	---	---
TETRACHLOROETHENE	127-18-4	45	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
TETRAHYDROFURAN	109-99-9		---	---	---	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	215	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	970	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
TRICHLOROETHYLENE	79-01-6	21	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
TRICHLOROFLUOROMETHANE	75-69-4		10U	---	10U	---	10U	---	10U	---	10U	---	---	---
VINYL CHLORIDE	75-01-4	930	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---	---	---
TOTAL XYLENES		19	15U	---	15U	---	15U	---	15U	---	15U	---	---	---
METALS TOTAL (µg/L)														
ARSENIC	7440-38-2	36	10U	---	10U	---	4U	---	4U	---	4.0U	---	---	---
BARIUM	7440-39-3	4	25U	---	**32.9J**	---	25U	---	25U	---	25U	---	---	---
CADMIUM	7440-43-9	7.9	10U	---	10U	---	4U	---	4U	---	4.0U	---	---	---
CHROMIUM	7440-47-3		25U	---	25U	---	25U	---	25U	---	25U	---	---	---
HEXAVALENT CHROMIUM	18540-29-9	50	---	---	---	---	2.1U	---	---	---	2.1U	2.1U	---	---
LEAD	7439-92-1	5.6	13U	---	**17.8J**	---	13U	---	**20.8J**	---	13U	---	---	---
MERCURY	7439-97-6	0.94	0.15U	---	0.15U	---	0.15U	---	0.15U	---	0.15U	---	---	---
SELENIUM	7782-49-2	71	25U	---	25U	---	10U	---	10U	---	10U	---	---	---
SILVER	7440-22-4	0.23	13U	---	13U	---	13U	---	13U	---	13U	---	---	---
METALS DISSOLVED (µg/L)														
ARSENIC, DISSOLVED	7440-38-2	36	---	4.0U	---	10U	---	4.0U	---	4.0U	---	---	**4.0J**	---
BARIUM, DISSOLVED	7440-39-3	4	---	25U	---	**29.1J**	---	25U	---	25U	---	---	25U	---
CADMIUM, DISSOLVED	7440-43-9	7.9	---	4.0U	---	10U	---	4.0U	---	4.0U	---	---	4.0U	---
CHROMIUM, DISSOLVED	7440-47-3		---	25U	---	25U	---	25U	---	25U	---	---	25U	---
HEXAVALENT CHROMIUM, DISSOLVED	18540-29-9	50	---	---	---	---	---	2.1U	---	---	---	---	2.1U	2.1U
LEAD, DISSOLVED	7439-92-1	5.6	---	13U	---	13U	---	13U	---	13U	---	---	13U	---
MERCURY, DISSOLVED	7439-97-6	0.94	---	0.15U	---	0.15U	---	0.15U	---	0.15U	---	---	0.15U	---
SELENIUM, DISSOLVED	7782-49-2	71	---	10U	---	25U	---	10U	---	10U	---	---	10U	---
SILVER, DISSOLVED	7440-22-4	0.23	---	13U	---	13U	---	13U	---	13U	---	---	13U	---

Notes:
1. Porewater data not screened against human health risk-based criteria.
2. Ecological risk-based screening levels are selected from the following source
   a) USEPA chronic AWQC for aquatic life (EPA, 2020)
   b) EPA Region III BTAG surface water screening values (EPA, 2006)
   c) Secondary Chronic Values derived by the Oak Ridge National Laboratory (
  See risk assessment for additional details.
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of
Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Ecological Screening Limit

Table 5-14
Summary of Pore Water Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

SAMPLE LOCATION			PW-ON-1		PW-ON-2		PW-ON-3		PW-ON-4		PW-ON-5			
SAMPLE ID			PW-ON-1-082615	PW-ON-1F-082615	PW-ON-2-082615	PW-ON-2F-082615	PW-ON-3-082615	PW-ON-3F-082615	PW-ON-4-082715	PW-ON-4F-082715	PW-ON-5-082715	PW-ON-59X-082715	PW-ON-5F-082715	PW-ON-59XF-082715
SAMPLE DATE			26-Aug-15	26-Aug-15	26-Aug-15	26-Aug-15	26-Aug-15	26-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15
QC IDENTIFIER														
ANALYTE	**CAS**	**ECO**												
VOCs (µg/L)														
1,1,1,2-TETRACHLOROETHANE	630-20-6		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,1,1-TRICHLOROETHANE	71-55-6	312	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	90.2	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,1,2-TRICHLORO-1,2,2-	76-13-1		---	---	---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	550	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,1-DICHLOROETHANE	75-34-3		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,1-DICHLOROETHENE	75-35-4	2240	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,1-DICHLOROPROPENE	563-58-6		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	110	20U	---	20U	---	20U	---	20U	---	20U	20U	---	---
1,2,3-TRICHLOROPROPANE	96-18-4		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	5.4	10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	19	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
1,2-DIBROMOETHANE	106-93-4		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
1,2-DICHLOROBENZENE	95-50-1		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,2-DICHLOROETHANE	107-06-2	1130	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,2-DICHLOROPROPANE	78-87-5	2400	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,3-DICHLOROBENZENE	541-73-1	28.5	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
1,3-DICHLOROPROPANE	142-28-9		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
1,4-DICHLOROBENZENE	106-46-7	19.9	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
2,2-DICHLOROPROPANE	594-20-7		20U	---	20U	---	20U	---	20U	---	20U	20U	---	---
2-BUTANONE (MEK)	78-93-3		50U	---	50U	---	50U	---	50U	---	50U	50U	---	---
2-CHLOROTOLUENE	95-49-8		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
2-HEXANONE	591-78-6		50U	---	50U	---	50U	---	50U	---	50U	50U	---	---
4-CHLOROTOLUENE	106-43-4		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
4-ISOPROPYLTOLUENE	99-87-6		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
4-METHYL-2-PENTANONE	108-10-1	123000	20U	---	20U	---	20U	---	20U	---	20U	20U	---	---
ACETONE	67-64-1	564000	50U	---	50U	---	50U	---	50U	---	50U	50U	---	---
BENZENE	71-43-2	110	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
BROMOBENZENE	108-86-1		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
BROMOMETHANE	74-83-9	120	10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
BROMOCHLOROMETHANE	74-97-5		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
BROMODICHLOROMETHANE	75-27-4		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
BROMOFORM	75-25-2	640	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
CARBON DISULFIDE	75-15-0	0.92	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
CARBON TETRACHLORIDE	56-23-5		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
CHLOROBENZENE	108-90-7	25	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
CHLOROETHANE	75-00-3		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
CHLOROFORM	67-66-3	815	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
CHLOROMETHANE	74-87-3	2700	10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	970	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
DIBROMOCHLOROMETHANE	124-48-1		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
DIBROMOMETHANE	74-95-3		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
DICHLORODIFLUOROMETHANE	75-71-8		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
DIISOPROPYL ETHER	108-20-3		---	---	---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	25	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
HEXACHLOROBUTADIENE	87-68-3	0.3	10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
ISOPROPYLBENZENE	98-82-8	110	10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
METHYL BROMIDE	74-83-9	120	---	---	---	---	---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
METHYLENE CHLORIDE	75-09-2	2560	10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
NAPHTHALENE	91-20-3	1.4	20U	---	20U	---	20U	---	20U	---	20U	20U	---	---
N-BUTYL BENZENE	104-51-8		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
N-PROPYL BENZENE	103-65-1		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
SEC-BUTYL BENZENE	135-98-8	110	10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
STYRENE	100-42-5	910	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---

Table 5-14
Summary of Pore Water Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

		SAMPLE LOCATION	PW-ON-1		PW-ON-2		PW-ON-3		PW-ON-4		PW-ON-5			
		SAMPLE ID	PW-ON-1-082615	PW-ON-1F-082615	PW-ON-2-082615	PW-ON-2F-082615	PW-ON-3-082615	PW-ON-3F-082615	PW-ON-4-082715	PW-ON-4F-082715	PW-ON-5-082715	PW-ON-59X-082715	PW-ON-5F-082715	PW-ON-59XF-082715
		SAMPLE DATE	26-Aug-15	26-Aug-15	26-Aug-15	26-Aug-15	26-Aug-15	26-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15
		QC IDENTIFIER												
ANALYTE	**CAS**	**ECO**												
VOCs (µg/L)														
TERT-BUTYLBENZENE	98-06-6	110	10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
TETRACHLOROETHENE	127-18-4	45	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
TETRAHYDROFURAN	109-99-9		---	---	---	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	215	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	970	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
TRICHLOROETHYLENE	79-01-6	21	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
TRICHLOROFLUOROMETHANE	75-69-4		10U	---	10U	---	10U	---	10U	---	10U	10U	---	---
VINYL CHLORIDE	75-01-4	930	5.0U	---	5U	---	5.0U	---	5.0U	---	5.0U	5.0U	---	---
TOTAL XYLENES		19	15U	---	15U	---	15U	---	15U	---	15U	15U	---	---
METALS TOTAL (µg/L)														
ARSENIC	7440-38-2	36	10U	---	10U	---	10U	---	10U	---	4.3J	4.0U	---	---
BARIUM	7440-39-3	4	25U	---	25U	---	25U	---	25U	---	25U	25U	---	---
CADMIUM	7440-43-9	7.9	10U	---	10U	---	10U	---	10U	---	4U	4.0U	---	---
CHROMIUM	7440-47-3		25U	---	25U	---	25U	---	25U	---	10U	10U	---	---
HEXAVALENT CHROMIUM	18540-29-9	50	---	---	---	---	---	---	---	---	---	---	---	---
LEAD	7439-92-1	5.6	25U	---	25U	---	25U	---	13U	---	13U	13U	---	---
MERCURY	7439-97-6	0.94	0.15U	---	0.15U	---	0.15U	---	0.15U	---	0.15U	0.15U	---	---
SELENIUM	7782-49-2	71	25U	---	**26.2J**	---	25U	---	**26.5J**	---	**22.7**	**17.5J**	---	---
SILVER	7440-22-4	0.23	13U	---	13U	---	13U	---	13U	---	5.0U	5.0U	---	---
METALS DISSOLVED (µg/L)														
ARSENIC, DISSOLVED	7440-38-2	36	---	10U	---	10U	---	10U	---	**6.1J**	---	---	4.0U	**4.0J**
BARIUM, DISSOLVED	7440-39-3	4	---	25U	---	25U	---	25U	---	25U	---	---	25U	25U
CADMIUM, DISSOLVED	7440-43-9	7.9	---	10U	---	10U	---	10U	---	4.0U	---	---	4U	4U
CHROMIUM, DISSOLVED	7440-47-3		---	25U	---	25U	---	25U	---	25U	---	---	10U	10U
HEXAVALENT CHROMIUM, DISSOLVED	18540-29-9	50	---	---	---	---	---	---	---	---	---	---	---	---
LEAD, DISSOLVED	7439-92-1	5.6	---	25U	---	13U	---	25U	---	25U	---	---	13U	13U
MERCURY, DISSOLVED	7439-97-6	0.94	---	0.15U	---	0.15U	---	0.15U	---	0.15U	---	---	0.15U	0.15U
SELENIUM, DISSOLVED	7782-49-2	71	---	25U	---	25U	---	25U	---	**38.4J**	---	---	**17J**	25U
SILVER, DISSOLVED	7440-22-4	0.23	---	13U	---	13U	---	13U	---	13U	---	---	5.0U	5.0U

Notes:
1. Porewater data not screened against human health risk-based criteria.
2. Ecological risk-based screening levels are selected from the following source
a) USEPA chronic AWQC for aquatic life (EPA, 2020)
b) EPA Region III BTAG surface water screening values (EPA, 2006)
c) Secondary Chronic Values derived by the Oak Ridge National Laboratory (
See risk assessment for additional details.
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Ecological Screening Limit

Table 5-14
Summary of Pore Water Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

		SAMPLE LOCATION	PW-ON-6		PW-ON-7		PW-ON-8		PW-ON-9		PW-ON-10	
		SAMPLE ID	PW-ON-6-082715	PW-ON-6F-082715	PW-ON-7-082715	PW-ON-7F-082715	PW-ON-8-082715	PW-ON-8F-082715	PW-ON-9-082515	PW-ON-9F-082515	PW-ON-10-082515	PW-ON-10F-082515
		SAMPLE DATE	27-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15	25-Aug-15	25-Aug-15	25-Aug-15	25-Aug-15
		QC IDENTIFIER										
ANALYTE	**CAS**	**ECO**										
VOCs (µg/L)												
1,1,1,2-TETRACHLOROETHANE	630-20-6		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,1,1-TRICHLOROETHANE	71-55-6	312	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	90.2	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,1,2-TRICHLORO-1,2,2-	76-13-1		---	---	---	---	---	---	---	---	---	---
1,1,2-TRICHLOROETHANE	79-00-5	550	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,1-DICHLOROETHANE	75-34-3		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,1-DICHLOROETHENE	75-35-4	2240	5.0U	---	5.0U	---	5.0U	---	**9.7J**	---	5.0U	---
1,1-DICHLOROPROPENE	563-58-6		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,2,3-TRICHLOROBENZENE	87-61-6	110	20U	---	20U	---	20U	---	20U	---	20U	---
1,2,3-TRICHLOROPROPANE	96-18-4		10U	---	10U	---	10U	---	10U	---	10U	---
1,2,4-TRICHLOROBENZENE	120-82-1	5.4	10U	---	10U	---	10U	---	10U	---	10U	---
1,2,4-TRIMETHYLBENZENE	95-63-6	19	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8		10U	---	10U	---	10U	---	10U	---	10U	---
1,2-DIBROMOETHANE	106-93-4		10U	---	10U	---	10U	---	10U	---	10U	---
1,2-DICHLOROBENZENE	95-50-1		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,2-DICHLOROETHANE	107-06-2	1130	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,2-DICHLOROPROPANE	78-87-5	2400	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,3,5-TRIMETHYLBENZENE	108-67-8		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,3-DICHLOROBENZENE	541-73-1	28.5	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
1,3-DICHLOROPROPANE	142-28-9		10U	---	10U	---	10U	---	10U	---	10U	---
1,4-DICHLOROBENZENE	106-46-7	19.9	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
2,2-DICHLOROPROPANE	594-20-7		20U	---	20U	---	20U	---	20U	---	20U	---
2-BUTANONE (MEK)	78-93-3		50U	---	50U	---	50U	---	50U	---	50U	---
2-CHLOROTOLUENE	95-49-8		10U	---	10U	---	10U	---	10U	---	10U	---
2-HEXANONE	591-78-6		50U	---	50U	---	50U	---	50U	---	50U	---
4-CHLOROTOLUENE	106-43-4		10U	---	10U	---	10U	---	10U	---	10U	---
4-ISOPROPYLTOLUENE	99-87-6		10U	---	10U	---	10U	---	10U	---	10U	---
4-METHYL-2-PENTANONE	108-10-1	123000	20U	---	20U	---	20U	---	20U	---	20U	---
ACETONE	67-64-1	564000	50U	---	50U	---	50U	---	50U	---	50U	---
BENZENE	71-43-2	110	5.0U	---	5.0U	---	5.0U	---	5.0U	---	**7.0J**	---
BROMOBENZENE	108-86-1		10U	---	10U	---	10U	---	10U	---	10U	---
BROMOMETHANE	74-83-9	120	10U	---	10U	---	10U	---	10U	---	10U	---
BROMOCHLOROMETHANE	74-97-5		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
BROMODICHLOROMETHANE	75-27-4		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
BROMOFORM	75-25-2	640	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CARBON DISULFIDE	75-15-0	0.92	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CARBON TETRACHLORIDE	56-23-5		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CHLOROBENZENE	108-90-7	25	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CHLOROETHANE	75-00-3		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CHLOROFORM	67-66-3	815	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CHLOROMETHANE	74-87-3	2700	10U	---	10U	---	10U	---	10U	---	10U	---
CIS-1,2-DICHLOROETHENE	156-59-2	970	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
CIS-1,3-DICHLOROPROPENE	10061-01-5		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
DIBROMOCHLOROMETHANE	124-48-1		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
DIBROMOMETHANE	74-95-3		10U	---	10U	---	10U	---	10U	---	10U	---
DICHLORODIFLUOROMETHANE	75-71-8		10U	---	10U	---	10U	---	10U	---	10U	---
DIISOPROPYL ETHER	108-20-3		---	---	---	---	---	---	---	---	---	---
ETHYLBENZENE	100-41-4	25	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
HEXACHLOROBUTADIENE	87-68-3	0.3	10U	---	10U	---	10U	---	10U	---	10U	---
ISOPROPYLBENZENE	98-82-8	110	10U	---	10U	---	10U	---	10U	---	10U	---
METHYL BROMIDE	74-83-9	120	---	---	---	---	---	---	---	---	---	---
METHYL TERT-BUTYL ETHER	1634-04-4		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
METHYLENE CHLORIDE	75-09-2	2560	10U	---	10U	---	10U	---	10U	---	10U	---
NAPHTHALENE	91-20-3	1.4	20U	---	20U	---	20U	---	20U	---	20U	---
N-BUTYL BENZENE	104-51-8		10U	---	10U	---	10U	---	10U	---	10U	---
N-PROPYL BENZENE	103-65-1		10U	---	10U	---	10U	---	10U	---	10U	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6		10U	---	10U	---	10U	---	10U	---	10U	---
SEC-BUTYL BENZENE	135-98-8	110	10U	---	10U	---	10U	---	10U	---	10U	---
STYRENE	100-42-5	910	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---

Table 5-14
Summary of Pore Water Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

		SAMPLE LOCATION	PW-ON-6		PW-ON-7		PW-ON-8		PW-ON-9		PW-ON-10	
		SAMPLE ID	PW-ON-6-082715	PW-ON-6F-082715	PW-ON-7-082715	PW-ON-7F-082715	PW-ON-8-082715	PW-ON-8F-082715	PW-ON-9-082515	PW-ON-9F-082515	PW-ON-10-082515	PW-ON-10F-082515
		SAMPLE DATE	27-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15	27-Aug-15	25-Aug-15	25-Aug-15	25-Aug-15	25-Aug-15
		QC IDENTIFIER										
ANALYTE	**CAS**	**ECO**										
VOCs (µg/L)												
TERT-BUTYLBENZENE	98-06-6	110	10U	---	10U	---	10U	---	10U	---	10U	---
TETRACHLOROETHENE	127-18-4	45	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TETRAHYDROFURAN	109-99-9		---	---	---	---	---	---	---	---	---	---
TOLUENE	108-88-3	215	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TRANS-1,2-DICHLOROETHENE	156-60-5	970	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6		5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TRICHLOROETHYLENE	79-01-6	21	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TRICHLOROFLUOROMETHANE	75-69-4		10U	---	10U	---	10U	---	10U	---	10U	---
VINYL CHLORIDE	75-01-4	930	5.0U	---	5.0U	---	5.0U	---	5.0U	---	5.0U	---
TOTAL XYLENES		19	15U	---	15U	---	15U	---	15U	---	15U	---
METALS TOTAL (µg/L)												
ARSENIC	7440-38-2	36	10U	---	10U	---	10U	---	4.0U	---	4.0U	---
BARIUM	7440-39-3	4	25U	---	25U	---	25U	---	25U	---	25U	---
CADMIUM	7440-43-9	7.9	10U	---	10U	---	10U	---	4.0U	---	4.0U	---
CHROMIUM	7440-47-3		25U	---	25U	---	25U	---	10U	---	25U	---
HEXAVALENT CHROMIUM	18540-29-9	50	---	---	---	---	---	---	2.1U	---	10U	---
LEAD	7439-92-1	5.6	13U	---	25U	---	25U	---	13U	---	13U	---
MERCURY	7439-97-6	0.94	0.15U	---	0.15U	---	0.15U	---	0.15U	---	0.15U	---
SELENIUM	7782-49-2	71	**30.4J**	---	25U	---	**25.3J**	---	10U	---	10U	---
SILVER	7440-22-4	0.23	13U	---	13U	---	13U	---	5.0U	---	5.0U	---
METALS DISSOLVED (µg/L)												
ARSENIC, DISSOLVED	7440-38-2	36	---	10U	---	10U	---	10U	---	**4.0J**	---	4.0U
BARIUM, DISSOLVED	7440-39-3	4	---	25U	---	25U	---	25U	---	25U	---	25U
CADMIUM, DISSOLVED	7440-43-9	7.9	---	10U	---	10U	---	10U	---	4U	---	4.0U
CHROMIUM, DISSOLVED	7440-47-3		---	25U	---	25U	---	25U	---	10U	---	10U
HEXAVALENT CHROMIUM, DISSOLVED	18540-29-9	50	---	---	---	---	---	---	---	2.1U	---	2.1U
LEAD, DISSOLVED	7439-92-1	5.6	---	25U	---	25U	---	25U	---	13U	---	13U
MERCURY, DISSOLVED	7439-97-6	0.94	---	0.15U	---	0.15U	---	0.15U	---	0.15U	---	0.15U
SELENIUM, DISSOLVED	7782-49-2	71	---	25.1J	---	25U	---	25U	---	10U	---	10U
SILVER, DISSOLVED	7440-22-4	0.23	---	13U	---	13U	---	13U	---	5.0U	---	5.0U

Notes:
1. Porewater data not screened against human health risk-based criteria.
2. Ecological risk-based screening levels are selected from the following source
   a) USEPA chronic AWQC for aquatic life (EPA, 2020)
   b) EPA Region III BTAG surface water screening values (EPA, 2006)
   c) Secondary Chronic Values derived by the Oak Ridge National Laboratory (
   See risk assessment for additional details.
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of
Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Ecological Screening Limit

Table 5-15
Summary of Surface Water Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SW-1A			SW-3A				SW-4A		
				SAMPLE ID	SW-1A - 11-30-2011	SW-1AF - 11-30-2011	SW-1AFDUP - 11-30-2011	SW-3A - 11-30-2011	SW-3AD - 11-30-2011	SW-3AF - 11-30-2011	SW-3ADF - 11-30-2011	SW-4A - 11-29-2011	SW-4ADUP - 11-29-2011	SW-4A F - 11-29-2011
				SAMPLE DATE	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11
				QC IDENTIFIER		DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	
ANALYTE	**CAS**	**HH**	**ECO**											
VOCs (µg/L)														
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,1,1-TRICHLOROETHANE	71-55-6	10000	312		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.2	90.2		0.5 U	---	---	0.5 U	0.5 U	---	---	0.5 U	---	---
1,1,2-TRICHLOROETHANE	79-00-5	0.55	550		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,1-DICHLOROETHANE	75-34-3	2.8	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,1-DICHLOROETHENE	75-35-4	300	25		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,1-DICHLOROPROPENE	563-58-6	---	---		2.0 U	---	---	2.0 U	2.0 U	---	---	2.0 U	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	0.071	110		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	0.071	5.4		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	19		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	---		5.0 U	---	---	5.0 U	5.0 U	---	---	5.0 U	---	---
1,2-DIBROMOETHANE	106-93-4	---	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,2-DICHLOROBENZENE	95-50-1	1000	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,2-DICHLOROETHANE	107-06-2	9.9	1130		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,2-DICHLOROPROPANE	78-87-5	0.90	2400		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,3-DICHLOROBENZENE	541-73-1	7	28.5		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,3-DICHLOROPROPANE	142-28-9	37	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
1,4-DICHLOROBENZENE	106-46-7	300	19.9		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
2,2-DICHLOROPROPANE	594-20-7	---	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
2-BUTANONE (MEK)	78-93-3	560	---		10 U	---	---	10 U	10 U	---	---	10 U	---	---
2-CHLOROTOLUENE	95-49-8	24	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
2-HEXANONE	591-78-6	3.8	---		10 U	---	---	10 U	10 U	---	---	10 U	---	---
4-CHLOROTOLUENE	106-43-4	25	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
4-ISOPROPYLTOLUENE	99-87-6	---	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
4-METHYL-2-PENTANONE	108-10-1	---	123000		10 U	---	---	10 U	10 U	---	---	10 U	---	---
ACETONE	67-64-1	1400	1500		10 U	---	---	10 U	10 U	---	---	10 U	---	---
BENZENE	71-43-2	0.46	110		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
BROMOBENZENE	108-86-1	6.2	---		2.0 U	---	---	2.0 U	2.0 U	---	---	2.0 U	---	---
BROMOMETHANE	74-83-9	0.75	120		2.0 U	---	---	2.0 U	2.0 U	---	---	2.0 U	---	---
BROMOCHLOROMETHANE	74-97-5	8.3	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
BROMODICHLOROMETHANE	75-27-4	0.13	---		0.6 U	---	---	0.6 U	0.6 U	---	---	0.6 U	---	---
BROMOFORM	75-25-2	7.0	640		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
CARBON DISULFIDE	75-15-0	81	0.92		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
CARBON TETRACHLORIDE	56-23-5	0.4	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
CHLOROBENZENE	108-90-7	100	25		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
CHLOROETHANE	75-00-3	2100	---		2.0 U	---	---	2.0 U	2.0 U	---	---	2.0 U	---	---
CHLOROFORM	67-66-3	60	815		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
CHLOROMETHANE	74-87-3	19	2700		2.0 U	---	---	2.0 U	2.0 U	---	---	2.0 U	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	970		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---		0.4 U	---	---	0.4 U	0.4 U	---	---	0.4 U	---	---
DIBROMOCHLOROMETHANE	124-48-1	0.87	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
DIBROMOMETHANE	74-95-3	0.83	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
DICHLORODIFLUOROMETHANE	75-71-8	20	---		2.0 U	---	---	2.0 U	2.0 U	---	---	2.0 U	---	---
ETHYLBENZENE	100-41-4	68	25		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
HEXACHLOROBUTADIENE	87-68-3	0.14	0.3		0.6 U	---	---	0.6 U	0.6 U	---	---	0.6 U	---	---
ISOPROPYLBENZENE	98-82-8	---	2.6		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
METHYL BROMIDE	74-83-9	---	120		2.0 U	---	---	2.0 U	2.0 U	---	---	2.0 U	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	---	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
METHYLENE CHLORIDE	75-09-2	20	2560		2.0 U	---	---	2.0 U	2.0 U	---	---	2.0 U	---	---
NAPHTHALENE	91-20-3	0.17	1.1		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
N-BUTYL BENZENE	104-51-8	---	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
N-PROPYL BENZENE	103-65-1	---	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
SEC-BUTYL BENZENE	135-98-8	---	110		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
STYRENE	100-42-5	120	910		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
TERT-BUTYLBENZENE	98-06-6	69	110		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
TETRACHLOROETHENE	127-18-4	10	45		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---

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Table 5-15
Summary of Surface Water Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SW-1A			SW-3A				SW-4A		
				SAMPLE ID	SW-1A - 11-30-2011	SW-1AF - 11-30-2011	SW-1AFDUP - 11-30-2011	SW-3A - 11-30-2011	SW-3AD - 11-30-2011	SW-3AF - 11-30-2011	SW-3ADF - 11-30-2011	SW-4A - 11-29-2011	SW-4ADUP - 11-29-2011	SW-4A F - 11-29-2011
				SAMPLE DATE	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	30-Nov-11	29-Nov-11	29-Nov-11	29-Nov-11
				QC IDENTIFIER		DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE	
ANALYTE	**CAS**	**HH**	**ECO**											
VOCs (µg/L)														
TOLUENE	108-88-3	57	2		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	100	970		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---		0.4 U	---	---	0.4 U	0.4 U	---	---	0.4 U	---	---
TRICHLOROETHYLENE	79-01-6	0.6	21		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
TRICHLOROFLUOROMETHANE	75-69-4	520	---		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
VINYL CHLORIDE	75-01-4	0.022	930		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
XYLENE O	95-47-6	---	13		1.0 U	---	---	1.0 U	1.0 U	---	---	1.0 U	---	---
XYLENE P,M	179601-23-1	---	13		2.0 U	---	---	2.0 U	2.0 U	---	---	2.0 U	---	---
PCBs (µg/L)														
AROCLOR 1016	12674-11-2	0.14	---		0.11 U	0.11 U	---	0.10 U	0.11 U	0.10 U	0.10 U	0.11 U	---	0.10 U
AROCLOR 1221	11104-28-2	0.0047	---		0.11 U	0.11 U	---	0.10 U	0.11 U	0.10 U	0.10 U	0.11 U	---	0.10 U
AROCLOR 1232	11141-16-5	0.0047	---		0.11 U	0.11 U	---	0.10 U	0.11 U	0.10 U	0.10 U	0.11 U	---	0.10 U
AROCLOR 1242	53469-21-9	0.0078	---		0.11 U	0.11 U	---	0.10 U	0.11 U	0.10 U	0.10 U	0.11 U	---	0.10 U
AROCLOR 1248	12672-29-6	0.0078	---		0.11 U	0.11 U	---	0.10 U	0.11 U	0.10 U	0.10 U	0.11 U	---	0.10 U
AROCLOR 1254	11097-69-1	0.0078	---		0.11 U	0.11 U	---	0.10 U	0.11 U	0.10 U	0.10 U	0.11 U	---	0.10 U
AROCLOR 1260	11096-82-5	0.0078	---		0.11 U	0.11 U	---	0.10 U	0.11 U	0.10 U	0.10 U	0.11 U	---	0.10 U
AROCLOR 1262	37324-23-5	---	---		0.11 U	0.11 U	---	0.10 U	0.11 U	0.10 U	0.10 U	0.11 U	---	0.10 U
AROCLOR 1268	11100-14-4	---	---		0.11 U	0.11 U	---	0.10 U	0.11 U	0.10 U	0.10 U	0.11 U	---	0.10 U
PCB, Total	1336-36-3	0.044	0.03		0.11 U	0.11 U	---	0.10 U	0.11 U	0.10 U	0.10 U	0.11 U	---	0.10 U
METALS TOTAL (µg/L)														
ARSENIC	7440-38-2	0.018	36		2.5 U	---	---	2.5 U	2.5 U	---	---	1.1 UJ	2.5 UJ	---
BARIUM	7440-39-3	1000	4		**6.2 J**	---	---	**13.2 J**	**13.2 J**	---	---	**4.7 J**	**4.7 J**	---
CADMIUM	7440-43-9	0.92	1.13		0.12 U	---	---	**0.06 J**	**0.05 J**	---	---	0.12 U	0.12 U	---
CHROMIUM	7440-47-3	---	11		10 U	---	---	10 U	10 U	---	---	10 U	10 U	---
LEAD	7439-92-1	15	4.83		**1.6 J**	---	---	2.5 U	2.5 U	---	---	2.5 U	2.5 U	---
MERCURY	7439-97-6	0.063	0.94		0.20 U	---	---	0.20 U	0.20 U	---	---	0.20 U	0.20 U	---
SELENIUM	7782-49-2	170	71		5.0 U	---	---	5.0 U	5.0 U	---	---	5.0 U	5.0 U	---
SILVER	7440-22-4	9.4	0.23		0.25 U	---	---	0.25 U	0.25 U	---	---	0.25 U	0.25 U	---
HEXAVALENT CHROMIUM	18540-29-9		50		---	---	---	---	---	---	---	---	---	---
METALS DISSOLVED (µg/L)														
ARSENIC, DISSOLVED	7440-38-2	0.018	36		---	2.5 UJ	**0.5 J**	---	---	2.5 U	2.5 U	---	---	2.5 U
BARIUM, DISSOLVED	7440-39-3	1000	4		---	**5.9 J**	**6.5 J**	---	---	**12 J**	**16 J**	---	---	**4.7 J**
CADMIUM, DISSOLVED	7440-43-9	0.92	1.13		---	0.12 U	0.12 U	---	---	**0.05 J**	**0.06 J**	---	---	0.12 U
CHROMIUM, DISSOLVED	7440-47-3	---	---		---	10 U	10 U	---	---	10 U	10 U	---	---	10 U
LEAD, DISSOLVED	7439-92-1	15	4.83		---	**0.9 J**	**0.9** J	---	---	2.5 U	2.5 U	---	---	2.5 U
MERCURY, DISSOLVED	7439-97-6	0.063	0.94		---	0.20 U	0.20 U	---	---	0.20 U	0.20 U	---	---	0.20 U
SELENIUM, DISSOLVED	7782-49-2	170	71		---	5.0 U	5.0 U	---	---	5.0 U	5.0 U	---	---	5.0 UJ
SILVER, DISSOLVED	7440-22-4	9.4	0.23		---	0.25 U	0.25 U	---	---	0.25 U	0.25 U	---	---	0.25 U

Notes:
1. Human health risk-based screening levels are EPA National Recommended Ambient Water Quality Criteria (AWQC).
If no AWQC is available, the EPA RSL for tap water is used.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA chronic AWQC for aquatic life (EPA, 2020)
b) EPA Region III BTAG surface water screening values (EPA, 2006)
c) Secondary Chronic Values derived by the Oak Ridge National Laboratory (ORNL)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level

Table 5-15
Summary of Surface Water Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SW-5A		SW-103			SW-104			SW-105		
				SAMPLE ID	SW-5A - 11-29-2011	SW-5A F - 11-29-2011	SW-103-A	SW-103-A-F	SW-103-AM	SW-104-A	SW-104-A-F	SW-104-AM	SW-105-A	SW-105-A-F	SW-105-AM
				SAMPLE DATE	29-Nov-11	29-Nov-11	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14
				QC IDENTIFIER											
ANALYTE	**CAS**	**HH**	**ECO**												
VOCs (µg/L)															
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
1,1,1-TRICHLOROETHANE	71-55-6	10000	312	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.2	90.2	0.5 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
1,1,2-TRICHLOROETHANE	79-00-5	0.55	550	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
1,1-DICHLOROETHANE	75-34-3	2.8	---	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
1,1-DICHLOROETHENE	75-35-4	300	25	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
1,1-DICHLOROPROPENE	563-58-6	---	---	2.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
1,2,3-TRICHLOROBENZENE	87-61-6	0.071	110	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	**0.12 J**
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
1,2,4-TRICHLOROBENZENE	120-82-1	0.071	5.4	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	19	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	---	5.0 U	---	2.0 U	---	0.25 U	2.0 U	---	0.25 U	2.0 U	---	0.25 U
1,2-DIBROMOETHANE	106-93-4	---	---	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
1,2-DICHLOROBENZENE	95-50-1	1000	---	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
1,2-DICHLOROETHANE	107-06-2	9.9	1130	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
1,2-DICHLOROPROPANE	78-87-5	0.90	2400	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
1,3-DICHLOROBENZENE	541-73-1	7	28.5	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
1,3-DICHLOROPROPANE	142-28-9	37	---	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
1,4-DICHLOROBENZENE	106-46-7	300	19.9	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
2,2-DICHLOROPROPANE	594-20-7	---	---	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
2-BUTANONE (MEK)	78-93-3	560	---	10 U	---	5.0 U	---	5.0 U	5.0 U	---	5.0 U	5.0 U	---	5.0 U
2-CHLOROTOLUENE	95-49-8	24	---	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
2-HEXANONE	591-78-6	3.8	---	10 U	---	5.0 U	---	2.5 U	5.0 U	---	2.5 U	5.0 U	---	2.5 U
4-CHLOROTOLUENE	106-43-4	25	---	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
4-ISOPROPYLTOLUENE	99-87-6	---	---	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
4-METHYL-2-PENTANONE	108-10-1	---	123000	10 U	---	5.0 U	---	2.5 U	5.0 U	---	2.5 U	5.0 U	---	2.5 U
ACETONE	67-64-1	1400	1500	10 U	---	5.0 U	---	5.0 U	5.0 U	---	5.0 U	5.0 U	---	**4.4 J**
BENZENE	71-43-2	0.46	110	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
BROMOBENZENE	108-86-1	6.2	---	2.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
BROMOMETHANE	74-83-9	0.75	120	2.0 U	---	1.0 U	---	0.59 U	1.0 U	---	0.59 U	1.0 U	---	0.59 U
BROMOCHLOROMETHANE	74-97-5	8.3	---	1.0 U	---	0.5 U	---	0.50 U	0.5 U	---	0.50 U	0.5 U	---	0.50 U
BROMODICHLOROMETHANE	75-27-4	0.13	---	0.6 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
BROMOFORM	75-25-2	7.0	640	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
CARBON DISULFIDE	75-15-0	81	0.92	1.0 U	---	1.0 U	---	0.25 U	1.0 U	---	0.25 U	1.0 U	---	**2.6**
CARBON TETRACHLORIDE	56-23-5	0.4	---	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
CHLOROBENZENE	108-90-7	100	25	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
CHLOROETHANE	75-00-3	2100	---	2.0 U	---	1.0 U	---	0.25 U	1.0 U	---	0.25 U	1.0 U	---	0.25 U
CHLOROFORM	67-66-3	60	815	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
CHLOROMETHANE	74-87-3	19	2700	2.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	970	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	0.4 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
DIBROMOCHLOROMETHANE	124-48-1	0.87	---	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
DIBROMOMETHANE	74-95-3	0.83	---	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
DICHLORODIFLUOROMETHANE	75-71-8	20	---	2.0 U	---	1.0 U	---	0.25 U	1.0 U	---	0.25 U	1.0 U	---	0.25 U
ETHYLBENZENE	100-41-4	68	25	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
HEXACHLOROBUTADIENE	87-68-3	0.14	0.3	0.6 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
ISOPROPYLBENZENE	98-82-8	---	2.6	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
METHYL BROMIDE	74-83-9	---	120	2.0 U	---	1.0 U	---	0.59 U	1.0 U	---	0.59 U	1.0 U	---	0.25 U
METHYL TERT-BUTYL ETHER	1634-04-4	---	---	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
METHYLENE CHLORIDE	75-09-2	20	2560	2.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
NAPHTHALENE	91-20-3	0.17	1.1	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	**0.18 J**
N-BUTYL BENZENE	104-51-8	---	---	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
N-PROPYL BENZENE	103-65-1	---	---	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
SEC-BUTYL BENZENE	135-98-8	---	110	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
STYRENE	100-42-5	120	910	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
TERT-BUTYLBENZENE	98-06-6	69	110	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U
TETRACHLOROETHENE	127-18-4	10	45	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U

Table 5-15
Summary of Surface Water Analytical Data - Off-Project Red Maple Swamp/Tidal Marsh
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

				SAMPLE LOCATION	SW-5A		SW-103			SW-104			SW-105		
				SAMPLE ID	SW-5A - 11-29-2011	SW-5A F - 11-29-2011	SW-103-A	SW-103-A-F	SW-103-AM	SW-104-A	SW-104-A-F	SW-104-AM	SW-105-A	SW-105-A-F	SW-105-AM
				SAMPLE DATE	29-Nov-11	29-Nov-11	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14	31-Jul-14
				QC IDENTIFIER											
ANALYTE	**CAS**	**HH**	**ECO**												
VOCs (µg/L)															
TOLUENE	108-88-3	57	2	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U	
TRANS-1,2-DICHLOROETHENE	156-60-5	100	970	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U	
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	0.4 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U	
TRICHLOROETHYLENE	79-01-6	0.6	21	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U	
TRICHLOROFLUOROMETHANE	75-69-4	520	---	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U	
VINYL CHLORIDE	75-01-4	0.022	930	1.0 U	---	0.5 U	---	0.25 U	0.5 U	---	0.25 U	0.5 U	---	0.25 U	
XYLENE O	95-47-6	---	13	1.0 U	---	0.2 U	---	0.25 U	0.2 U	---	0.25 U	0.2 U	---	0.25 U	
XYLENE P,M	179601-23-1	---	13	2.0 U	---	0.4 U	---	0.50 U	0.4 U	---	0.50 U	0.4 U	---	0.50 U	
PCBs (µg/L)															
AROCLOR 1016	12674-11-2	0.14	---	0.10 U	0.10 U	---	---	---	---	---	---	---	---	---	
AROCLOR 1221	11104-28-2	0.0047	---	0.10 U	0.10 U	---	---	---	---	---	---	---	---	---	
AROCLOR 1232	11141-16-5	0.0047	---	0.10 U	0.10 U	---	---	---	---	---	---	---	---	---	
AROCLOR 1242	53469-21-9	0.0078	---	0.10 U	0.10 U	---	---	---	---	---	---	---	---	---	
AROCLOR 1248	12672-29-6	0.0078	---	0.10 U	0.10 U	---	---	---	---	---	---	---	---	---	
AROCLOR 1254	11097-69-1	0.0078	---	0.10 U	0.10 U	---	---	---	---	---	---	---	---	---	
AROCLOR 1260	11096-82-5	0.0078	---	0.10 U	0.10 U	---	---	---	---	---	---	---	---	---	
AROCLOR 1262	37324-23-5	---	---	0.10 U	0.10 U	---	---	---	---	---	---	---	---	---	
AROCLOR 1268	11100-14-4	---	---	0.10 U	0.10 U	---	---	---	---	---	---	---	---	---	
PCB, Total	1336-36-3	0.044	0.03	0.10 U	0.10 U	---	---	---	---	---	---	---	---	---	
METALS TOTAL (µg/L)															
ARSENIC	7440-38-2	0.018	36	2.0 U	---	1.0 U	---	---	1.0 U	---	---	1.0 U	---	---	
BARIUM	7440-39-3	1000	4	**4.2 J**	---	**13.1 J**	---	---	**13.5 J**	---	---	**9.7 J**	---	---	
CADMIUM	7440-43-9	0.92	1.13	0.12 U	---	**0.04 J**	---	---	**0.03 J**	---	---	0.10 U	---	---	
CHROMIUM	7440-47-3	---	11	10 U	---	3.0 U	---	---	3.0 U	---	---	**2.4 J**	---	---	
LEAD	7439-92-1	15	4.83	2.5 U	---	1.0 U	---	---	**0.6 J**	---	---	1.0 U	---	---	
MERCURY	7439-97-6	0.063	0.94	0.20 U	---	0.20 U	---	---	0.20 U	---	---	0.20 U	---	---	
SELENIUM	7782-49-2	170	71	5.0 U	---	2.0 U	---	---	2.0 U	---	---	2.0 U	---	---	
SILVER	7440-22-4	9.4	0.23	0.25 U	---	**0.10 J**	---	---	0.10 U	---	---	0.10 U	---	---	
HEXAVALENT CHROMIUM	18540-29-9		50	---	---	---	---	---	---	---	---	---	---	---	
METALS DISSOLVED (µg/L)															
ARSENIC, DISSOLVED	7440-38-2	0.018	36	---	1.7 U	---	1.0 U	---	---	---	1.0 U	---	---	1.0 U	---
BARIUM, DISSOLVED	7440-39-3	1000	4	---	**4.1 J**	---	**14.5 J**	---	---	---	**16.2 J**	---	---	**9.7 J**	---
CADMIUM, DISSOLVED	7440-43-9	0.92	1.13	---	0.12 U	---	**0.05 J**	---	---	---	**0.05 J**	---	---	0.10 U	---
CHROMIUM, DISSOLVED	7440-47-3	---	---	---	10 U	---	3.0 U	---	---	---	3.0 U	---	---	**2.3 J**	---
LEAD, DISSOLVED	7439-92-1	15	4.83	---	2.5 U	---	**0.5 J**	---	---	---	**1.2 J**	---	---	1.0 U	---
MERCURY, DISSOLVED	7439-97-6	0.063	0.94	---	0.20 U	---	0.20 U	---	---	---	0.20 U	---	---	0.20 U	---
SELENIUM, DISSOLVED	7782-49-2	170	71	---	5.0 UJ	---	2.0 U	---	---	---	2.0 U	---	---	2.0 U	---
SILVER, DISSOLVED	7440-22-4	9.4	0.23	---	0.25 U	---	0.10 U	---	---	---	0.10 U	---	---	0.10 U	---

Notes:
1. Human health risk-based screening levels are EPA National Recommended Ambient Water Quality Criteria (AWQC).
If no AWQC is available, the EPA RSL for tap water is used.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA chronic AWQC for aquatic life (EPA, 2020)
b) EPA Region III BTAG surface water screening values (EPA, 2006)
c) Secondary Chronic Values derived by the Oak Ridge National Laboratory (ORNL)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit
Shaded = Exceeds Ecological Screening Level but not Human Health Screening Level

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Table 5-16
Summary of Surface Water Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	SW-1		SW-2		SW-3			
			SAMPLE ID	SW-1-090115	SW-1F-090115	SW-2-090115	SW-2F-090115	SW-3-090115	SW-3X-090115	SW-3F-090115	SW-3XF-090115
			SAMPLE DATE	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15
			QC IDENTIFIER					DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE
ANALYTE	**CAS**	**HH**	**ECO**								
VOCs (µg/L)											
1,1,1,2-TETRACHLOROETHANE	630-20-6	0.57	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,1,1-TRICHLOROETHANE	71-55-6	10000	312	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.2	90.2	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,1,2-TRICHLOROETHANE	79-00-5	0.55	550	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,1-DICHLOROETHANE	75-34-3	2.8	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,1-DICHLOROETHENE	75-35-4	300	2240	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,1-DICHLOROPROPENE	563-58-6	---	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,2,3-TRICHLOROBENZENE	87-61-6	0.7	110	20 U	---	20 U	---	20 U	20 U	---	---
1,2,3-TRICHLOROPROPANE	96-18-4	0.00075	---	10 U	---	10 U	---	10 U	10 U	---	---
1,2,4-TRICHLOROBENZENE	120-82-1	0.071	5.4	10 U	---	10 U	---	10 U	10 U	---	---
1,2,4-TRIMETHYLBENZENE	95-63-6	5.6	19	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	0.00033	---	10 U	---	10 U	---	10 U	10 U	---	---
1,2-DIBROMOETHANE	106-93-4	---	---	10 U	---	10 U	---	10 U	10 U	---	---
1,2-DICHLOROBENZENE	95-50-1	1000	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,2-DICHLOROETHANE	107-06-2	9.9	1130	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,2-DICHLOROPROPANE	78-87-5	0.90	2400	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,3,5-TRIMETHYLBENZENE	108-67-8	6	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,3-DICHLOROBENZENE	541-73-1	7	28.5	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
1,3-DICHLOROPROPANE	142-28-9	37	---	10 U	---	10 U	---	10 U	10 U	---	---
1,4-DICHLOROBENZENE	106-46-7	300	19.9	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
2,2-DICHLOROPROPANE	594-20-7	---	---	20 U	---	20 U	---	20 U	20 U	---	---
2-BUTANONE (MEK)	78-93-3	560	---	50 U	---	50 U	---	50 U	50 U	---	---
2-CHLOROTOLUENE	95-49-8	24	---	10 U	---	10 U	---	10 U	10 U	---	---
2-HEXANONE	591-78-6	3.8	---	50 U	---	50 U	---	50 U	50 U	---	---
4-CHLOROTOLUENE	106-43-4	25	---	10 U	---	10 U	---	10 U	10 U	---	---
4-ISOPROPYLTOLUENE	99-87-6	---	---	10 U	---	10 U	---	10 U	10 U	---	---
4-METHYL-2-PENTANONE	108-10-1	---	123000	20 U	---	20 U	---	20 U	20 U	---	---
ACETONE	67-64-1	1400	564000	50 U	---	50 U	---	50 U	50 U	---	---
BENZENE	71-43-2	0.46	110	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
BROMOBENZENE	108-86-1	6.2	---	10 U	---	10 U	---	10 U	10 U	---	---
BROMOMETHANE	74-83-9	0.75	120	10 U	---	10 U	---	10 U	10 U	---	---
BROMOCHLOROMETHANE	74-97-5	8.3	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
BROMODICHLOROMETHANE	75-27-4	0.13	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
BROMOFORM	75-25-2	7.0	640	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
CARBON DISULFIDE	75-15-0	81	0.92	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
CARBON TETRACHLORIDE	56-23-5	0.4	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
CHLOROBENZENE	108-90-7	100	25	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
CHLOROETHANE	75-00-3	2100	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
CHLOROFORM	67-66-3	60	815	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
CHLOROMETHANE	74-87-3	19	2700	10 U	---	10 U	---	10 U	10 U	---	---
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	970	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
CIS-1,3-DICHLOROPROPENE	10061-01-5	---	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
DIBROMOCHLOROMETHANE	124-48-1	0.87	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
DIBROMOMETHANE	74-95-3	0.83	---	10 U	---	10 U	---	10 U	10 U	---	---
DICHLORODIFLUOROMETHANE	75-71-8	20	---	10 U	---	10 U	---	10 U	10 U	---	---
ETHYLBENZENE	100-41-4	68	25	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
HEXACHLOROBUTADIENE	87-68-3	0.14	0.3	10 U	---	10 U	---	10 U	10 U	---	---
ISOPROPYLBENZENE	98-82-8	---	110	10 U	---	10 U	---	10 U	10 U	---	---
METHYL BROMIDE	74-83-9	---	120	10 U	---	10 U	---	10 U	10 U	---	---
METHYL TERT-BUTYL ETHER	1634-04-4	---	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
METHYLENE CHLORIDE	75-09-2	20	2560	10 U	---	10 U	---	10 U	10 U	---	---
NAPHTHALENE	91-20-3	0.17	1.4	20 U	---	20 U	---	20 U	20 U	---	---
N-BUTYL BENZENE	104-51-8	---	---	10 U	---	10 U	---	10 U	10 U	---	---
N-PROPYL BENZENE	103-65-1	---	---	10 U	---	10 U	---	10 U	10 U	---	---
P-CYMENE (P-ISOPROPYLTOLUENE)	99-87-6	---	---	10 U	---	10 U	---	10 U	10 U	---	---
SEC-BUTYL BENZENE	135-98-8	---	110	10 U	---	10 U	---	10 U	10 U	---	---
STYRENE	100-42-5	120	910	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
TERT-BUTYLBENZENE	98-06-6	69	110	10 U	---	10 U	---	10 U	10 U	---	---
TETRACHLOROETHENE	127-18-4	10	45	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---

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Table 5-16
Summary of Surface Water Analytical Data - Off-Project Narragansett Bay/Beachfront
Former Blue Beach Disposal Area FUDS
North Kingstown, Rhode Island

			SAMPLE LOCATION	SW-1		SW-2		SW-3			
			SAMPLE ID	SW-1-090115	SW-1F-090115	SW-2-090115	SW-2F-090115	SW-3-090115	SW-3X-090115	SW-3F-090115	SW-3XF-090115
			SAMPLE DATE	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15	01-Sep-15
			QC IDENTIFIER					DUPLICATE	DUPLICATE	DUPLICATE	DUPLICATE
ANALYTE	**CAS**	**HH**	**ECO**								
VOCs (µg/L)											
TOLUENE	108-88-3	57	215	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
TRANS-1,2-DICHLOROETHENE	156-60-5	100	970	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
TRANS-1,3-DICHLOROPROPENE	10061-02-6	---	---	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
TRICHLOROETHYLENE	79-01-6	0.6	21	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
TRICHLOROFLUOROMETHANE	75-69-4	520	---	10 U	---	10 U	---	10 U	10 U	---	---
VINYL CHLORIDE	75-01-4	0.022	930	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
XYLENE O	95-47-6	---	19	5.0 U	---	5.0 U	---	5.0 U	5.0 U	---	---
XYLENE P,M	179601-23-1	---	19	10 U	---	10 U	---	10 U	10 U	---	---
METALS TOTAL (µg/L)											
ARSENIC	7440-38-2	0.018	36	4.0 U	---	4.0 U	---	10 U	4.0 U	---	---
BARIUM	7440-39-3	1000	4	25 U	---	25 U	---	25 U	25 U	---	---
CADMIUM	7440-43-9	0.92	7.9	4.0 U	---	4.0 U	---	10 U	4.0 U	---	---
CHROMIUM	7440-47-3	---	50	25 U	---	25 U	---	25 U	25 U	---	---
LEAD	7439-92-1	15	5.6	13 U	---	13 U	---	13 U	13 U	---	---
MERCURY	7439-97-6	0.063	0.94	0.15 U	---	0.15 U	---	0.15 U	0.15 U	---	---
SELENIUM	7782-49-2	170	71	10 U	---	10 U	---	25 U	10 U	---	---
SILVER	7440-22-4	9.4	0.23	13 U	---	13 U	---	13 U	13 U	---	---
HEXAVALENT CHROMIUM	18540-29-9	---	50	0.0021 U	---	0.0021 U	---	0.0021 U	0.0021 U	---	---
METALS DISSOLVED (µg/L)											
ARSENIC, DISSOLVED	7440-38-2	0.018	36	---	4.0 U	---	10 U	---	---	10 U	10 U
BARIUM, DISSOLVED	7440-39-3	1000	4	---	25 U	---	25 U	---	---	25 U	25 U
CADMIUM, DISSOLVED	7440-43-9	0.92	7.9	---	4.0 U	---	10 U	---	---	10 U	10 U
CHROMIUM, DISSOLVED	7440-47-3	---	50	---	25 U	---	25 U	---	---	25 U	25 U
LEAD, DISSOLVED	7439-92-1	15	5.6	---	13 U	---	13 U	---	---	13 U	13 U
MERCURY, DISSOLVED	7439-97-6	0.063	0.94	---	0.15 U	---	0.15 U	---	---	0.15 U	0.15 U
SELENIUM, DISSOLVED	7782-49-2	170	71	---	10 U	---	25 U	---	---	25 U	25 U
SILVER, DISSOLVED	7440-22-4	9.4	0.23	---	13 U	---	13 U	---	---	13 U	13 U

Notes:
1. Human health risk-based screening levels are EPA National Recommended Ambient Water Quality Criteria (AWQC).
If no AWQC is available, the EPA RSL for tap water is used.
See risk assessment for additional details and statistical analysis.
2. Ecological risk-based screening levels are selected from the following sources:
a) USEPA chronic AWQC for aquatic life (EPA, 2020)
b) EPA Region III BTAG surface water screening values (EPA, 2006)
c) Secondary Chronic Values derived by the Oak Ridge National Laboratory (ORNL)
See risk assessment for additional details.
EN = Essential Nutrient
--- = Sample not analyzed for this parameter
Bold = Detected
U = Not detected above the concentration listed, usually laboratory Limit of Detection (LOD) or the blank-corrected validated value
J = Estimated value
Shaded = Exceeds Human Health or Ecological Screening Limit

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FIGURES

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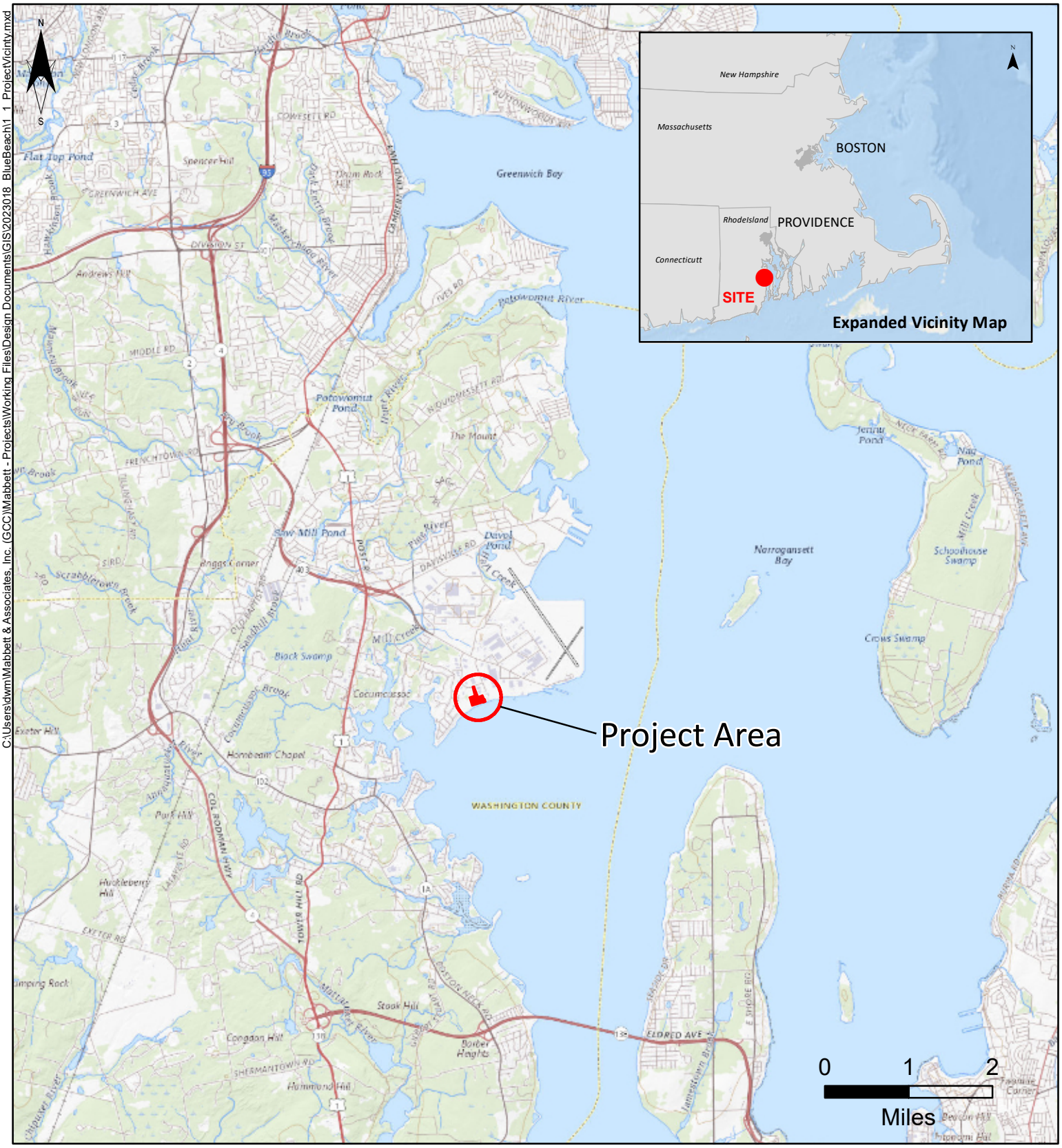

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PROJECT VICINITY MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 1-1

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024

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PROJECT LOCATION MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 1-2

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024

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SITE MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 1-3

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024

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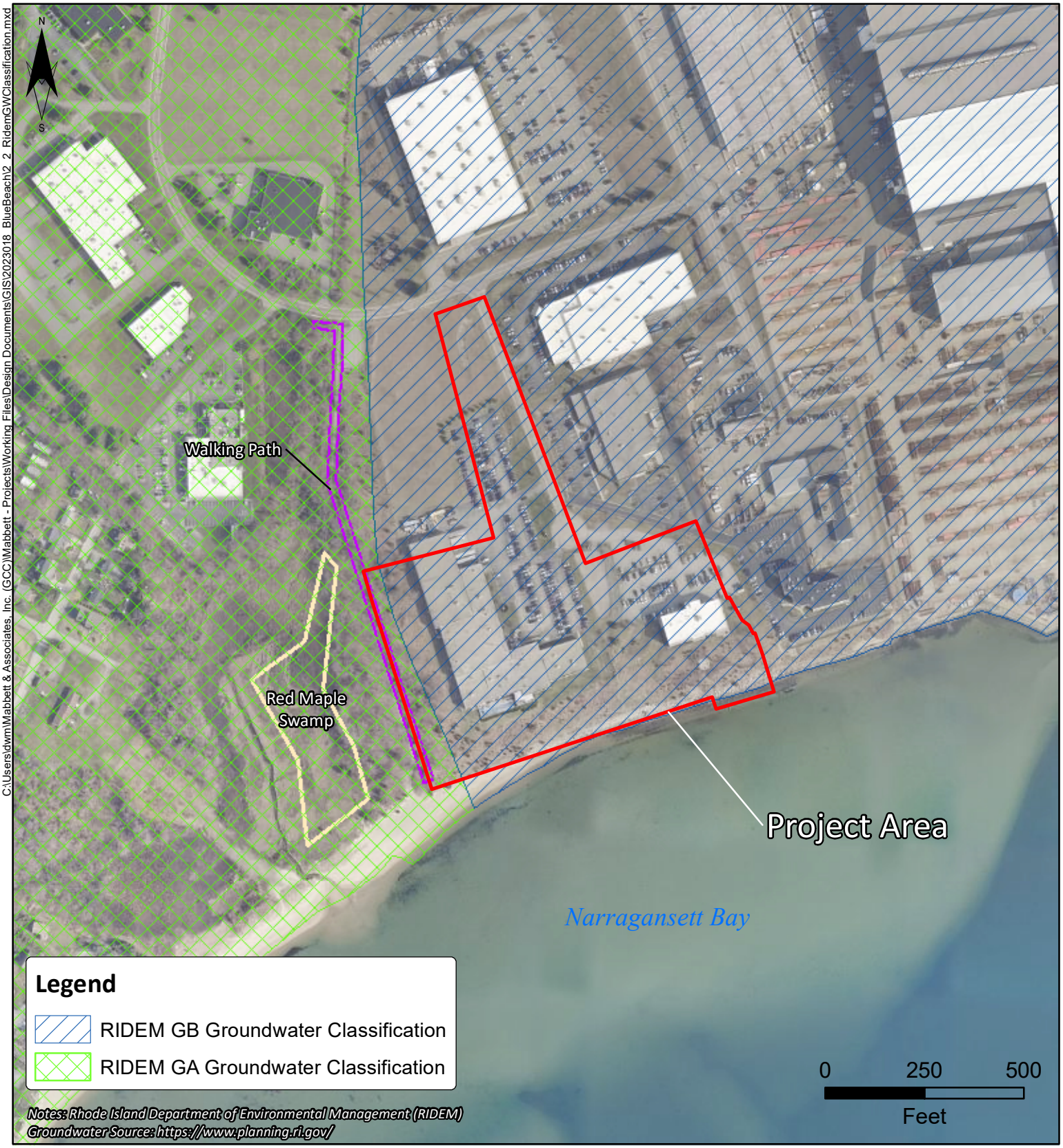
PARCEL MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 2-1

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024



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RIDEM GROUNDWATER CLASSIFICATION MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 2-2

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
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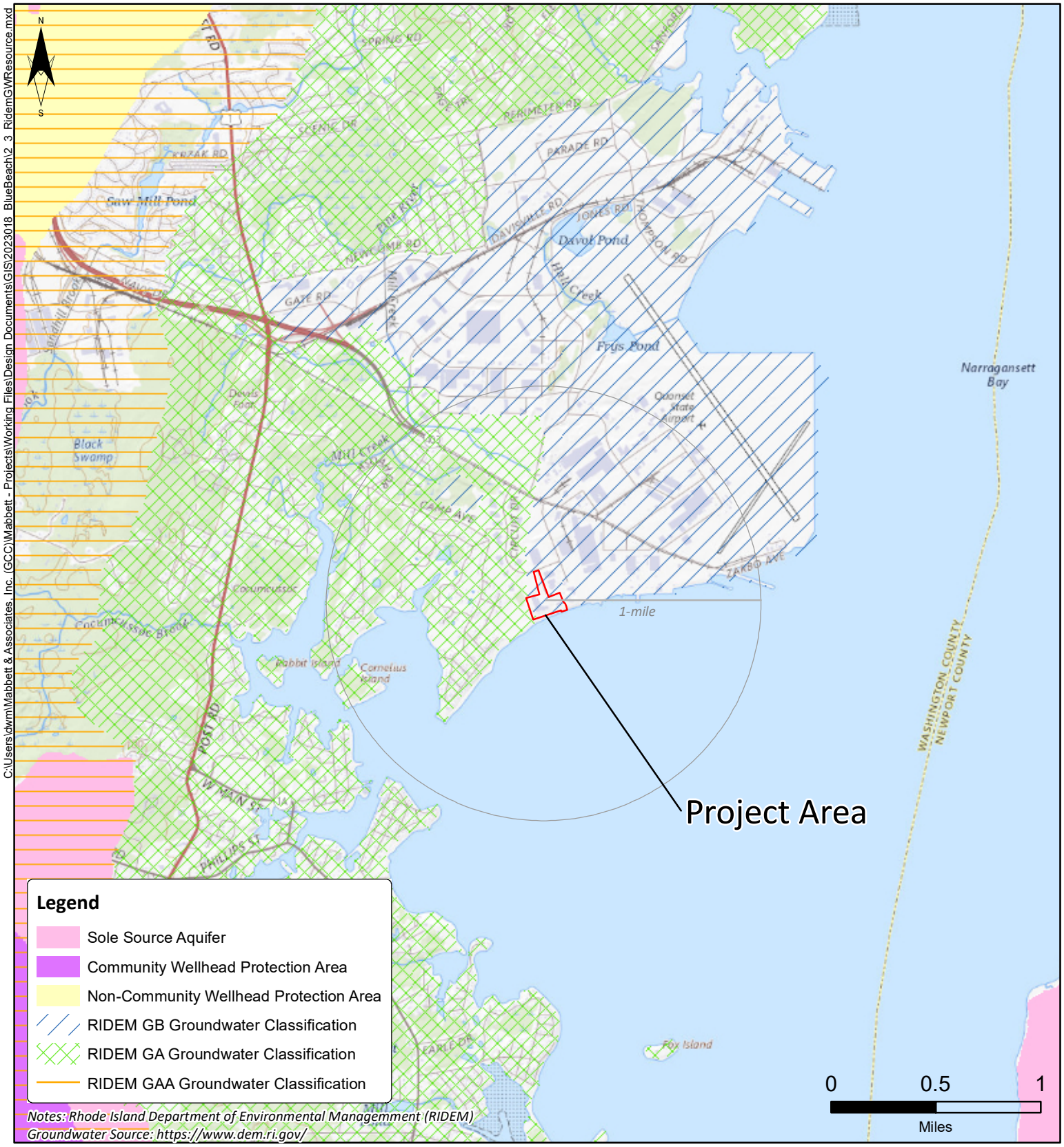

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RIDEM GROUNDWATER RESOURCE MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 2-3

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
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1984 DRUM STORAGE SOIL INVESTIGATION

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-1

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1988 CONTAMINATION CONFIRMATION STUDY

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-2

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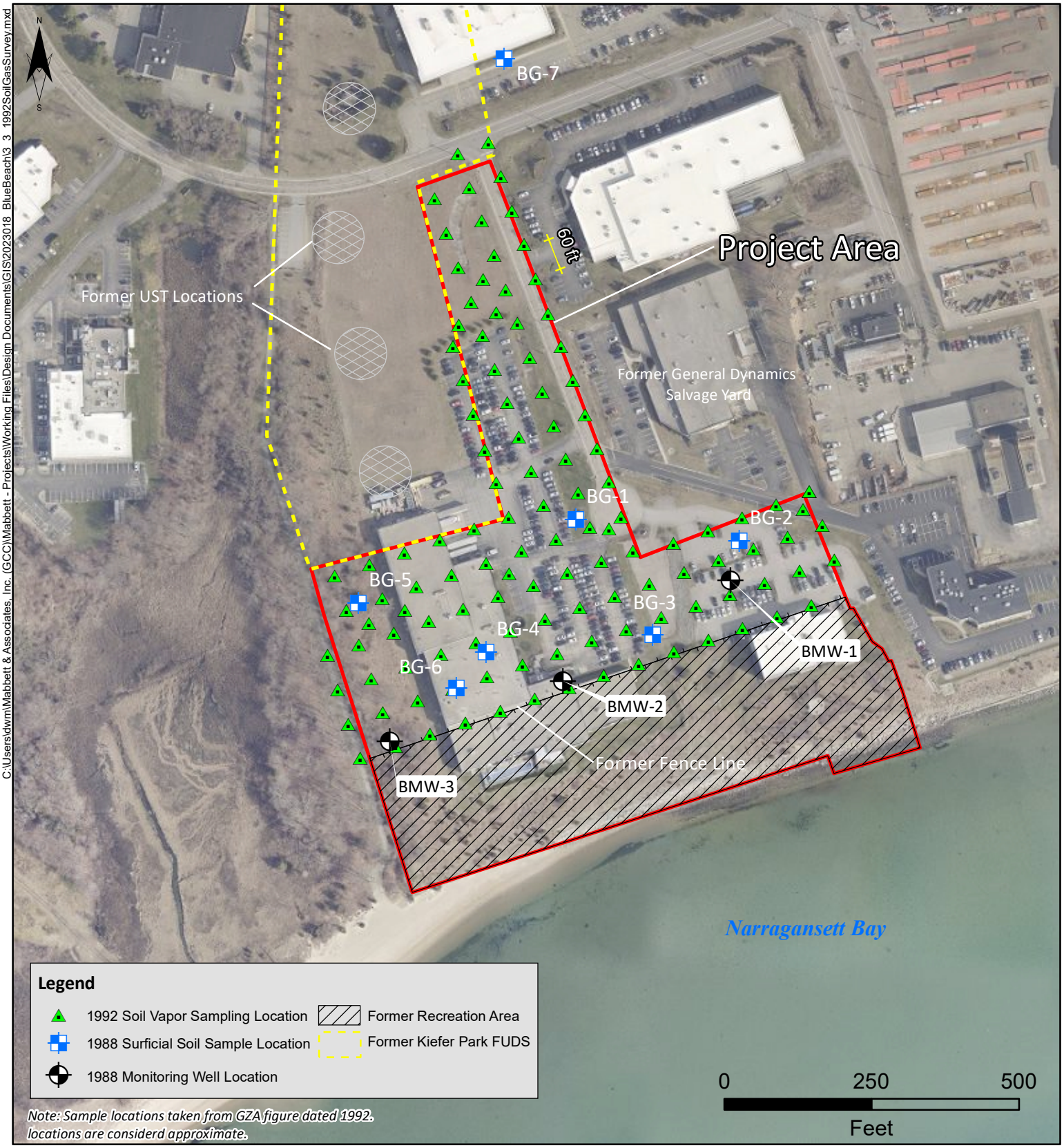

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1992 SOIL GAS SURVEY

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-3

Drawn: DWM	Approved: SAV
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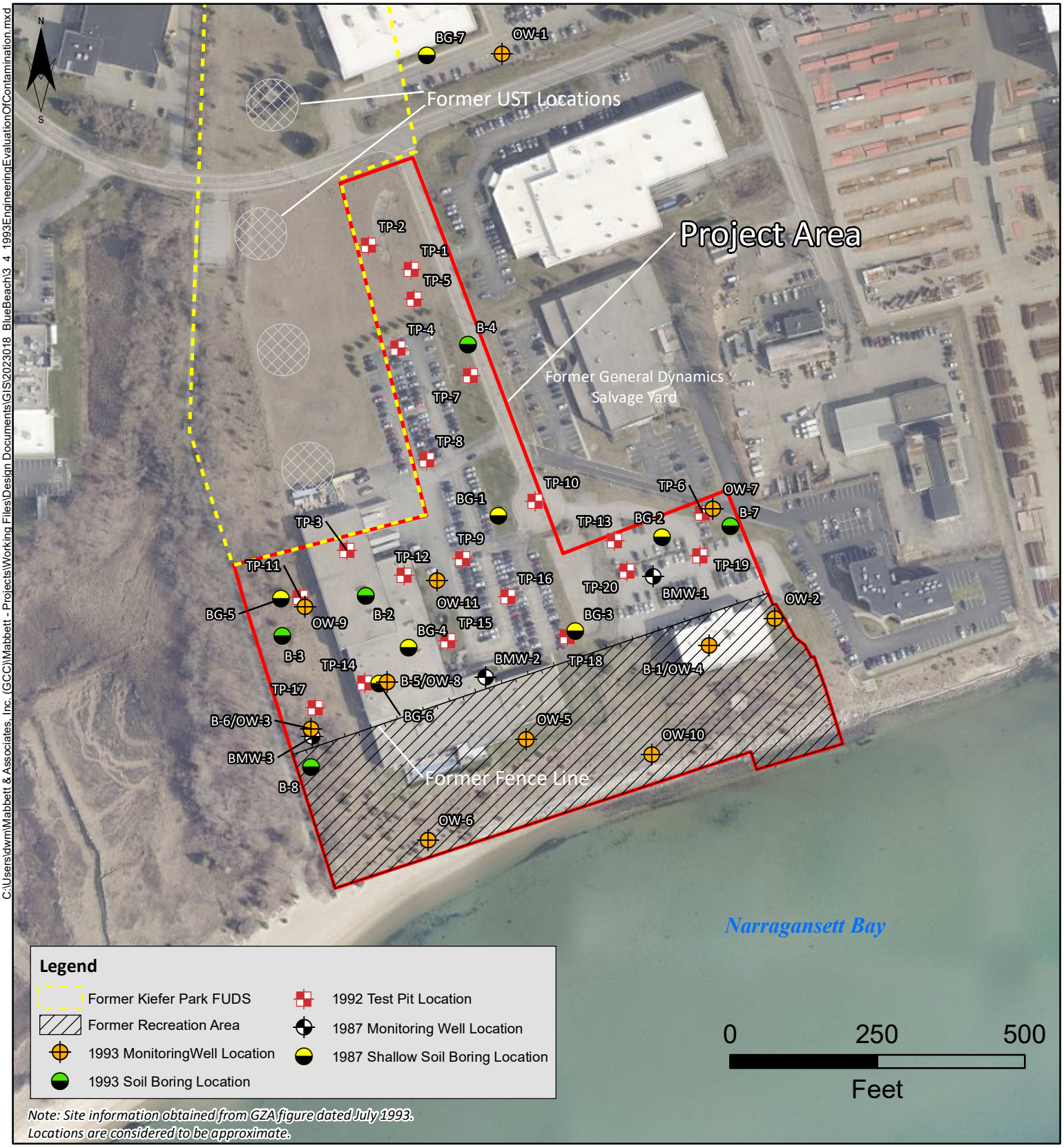

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1993 ENGINEERING EVALUATION OF CONTAMINATION

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-4

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
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1994 SUPPLEMENTAL ENGINEERING EVALUATION OF CONTAMINATION MAP SURFACE SOIL AND SEDIMENT SAMPLING LOCATIONS

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-5

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
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1994 SUPPLEMENTAL ENGINEERING EVALUATION OF CONTAMINATION MAP SOIL BORING AND MONITORING WELL LOCATIONS

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-6

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
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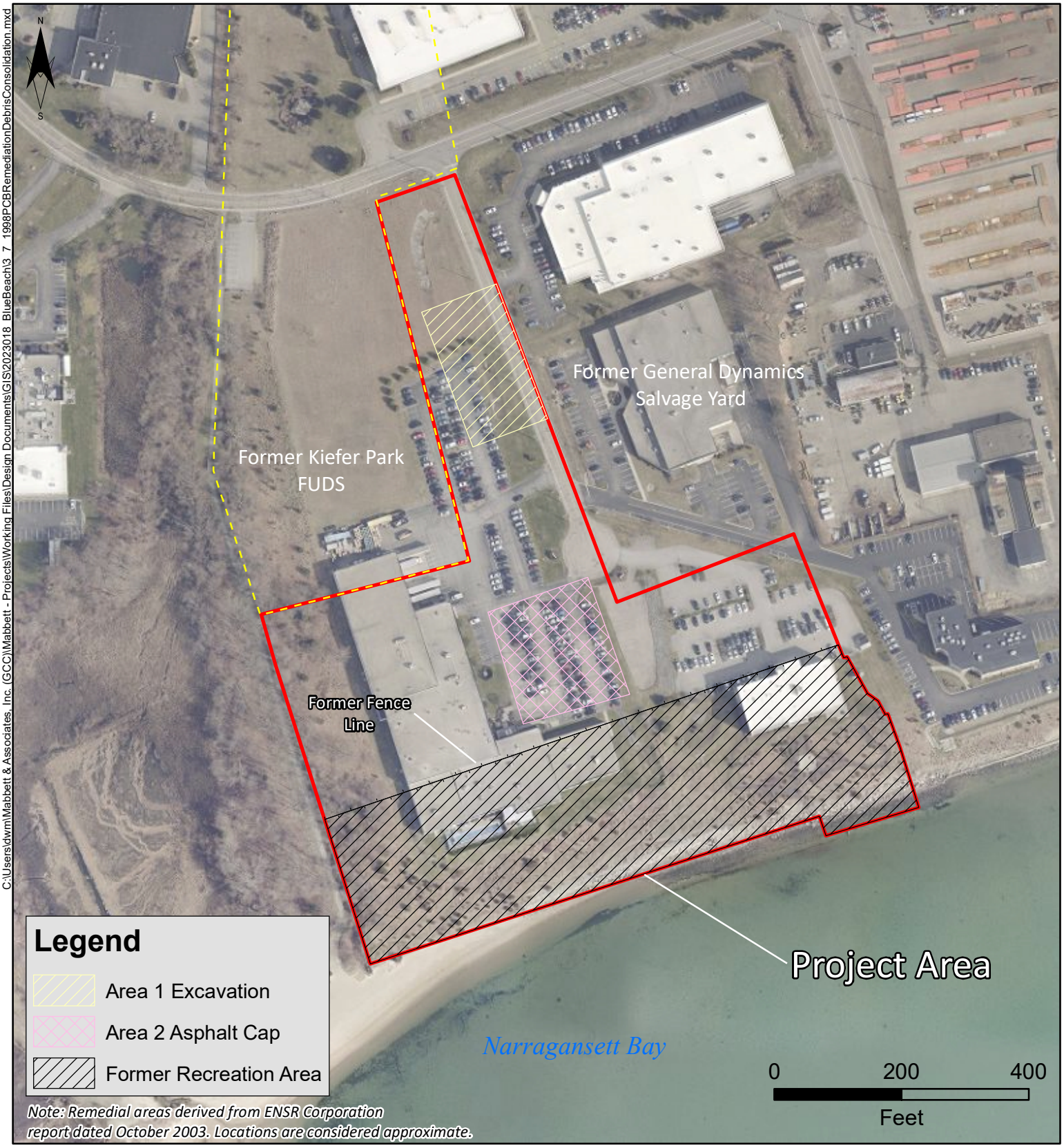

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1998-1999 BLUE BEACH PCB REMEDIATION AND DEBRIS CONSOLIDATION

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-7

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
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2001 PHASE I/II MONITORING WELL AND SOIL BORING PLAN

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-8

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2001 GEOTECHNICAL INVESTIGATION SITE PLAN

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-9

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
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2001-2002 PHASE III INVESTIGATION AND REMEDIATION
Former Blue Beach Disposal Area
North Kingstown, Rhode Island

Figure 3-10

Drawn: DWM	Approved: SAV
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2002 LIMITED SEEPAGE INVESTIGATION SAMPLE PLAN

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-11

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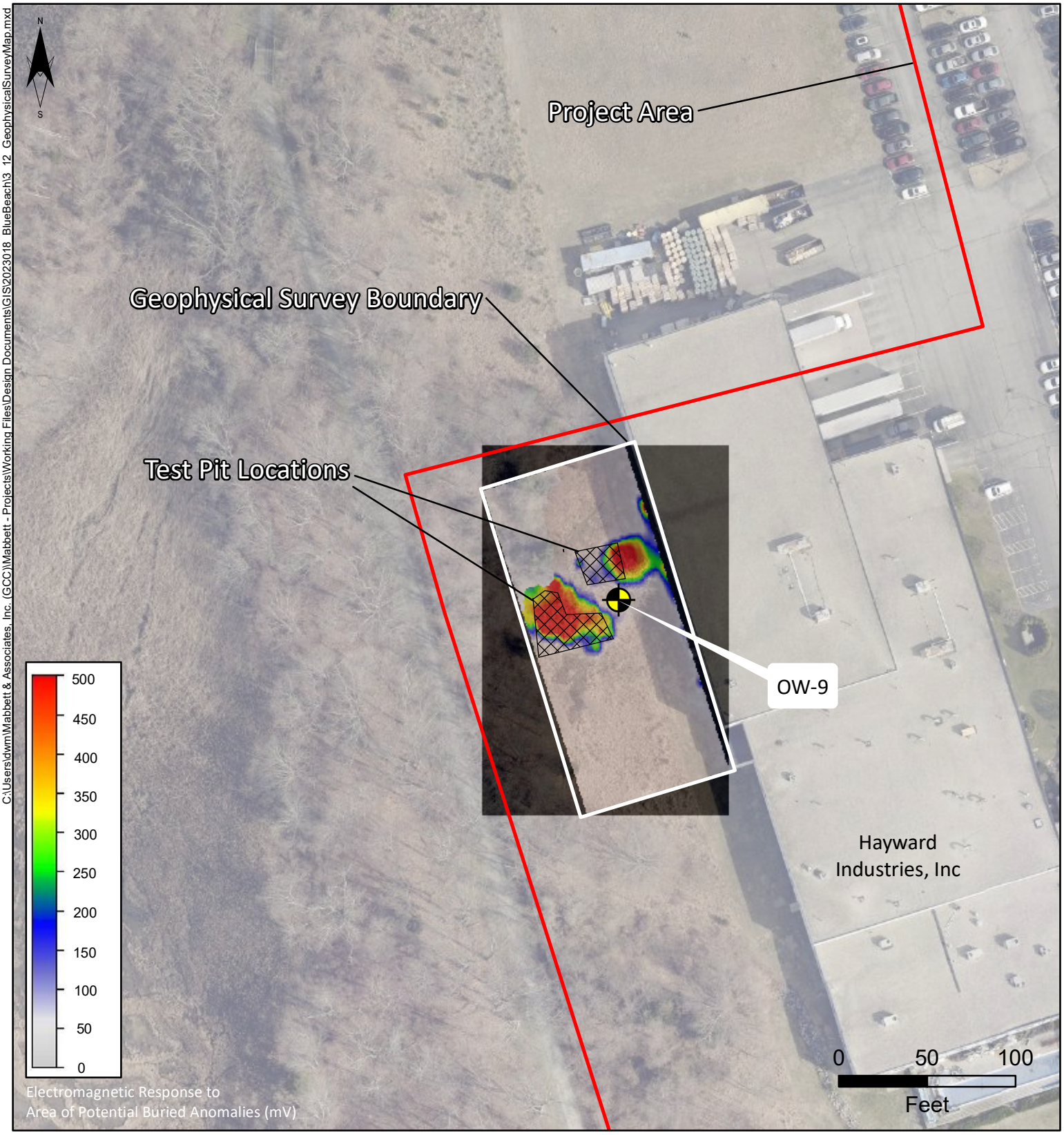

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2009 GEOPHYSICAL SURVEY MAP
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North Kingstown, Rhode Island

Figure 3-12

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Projection: NAD83 RI State Plane (Feet)	
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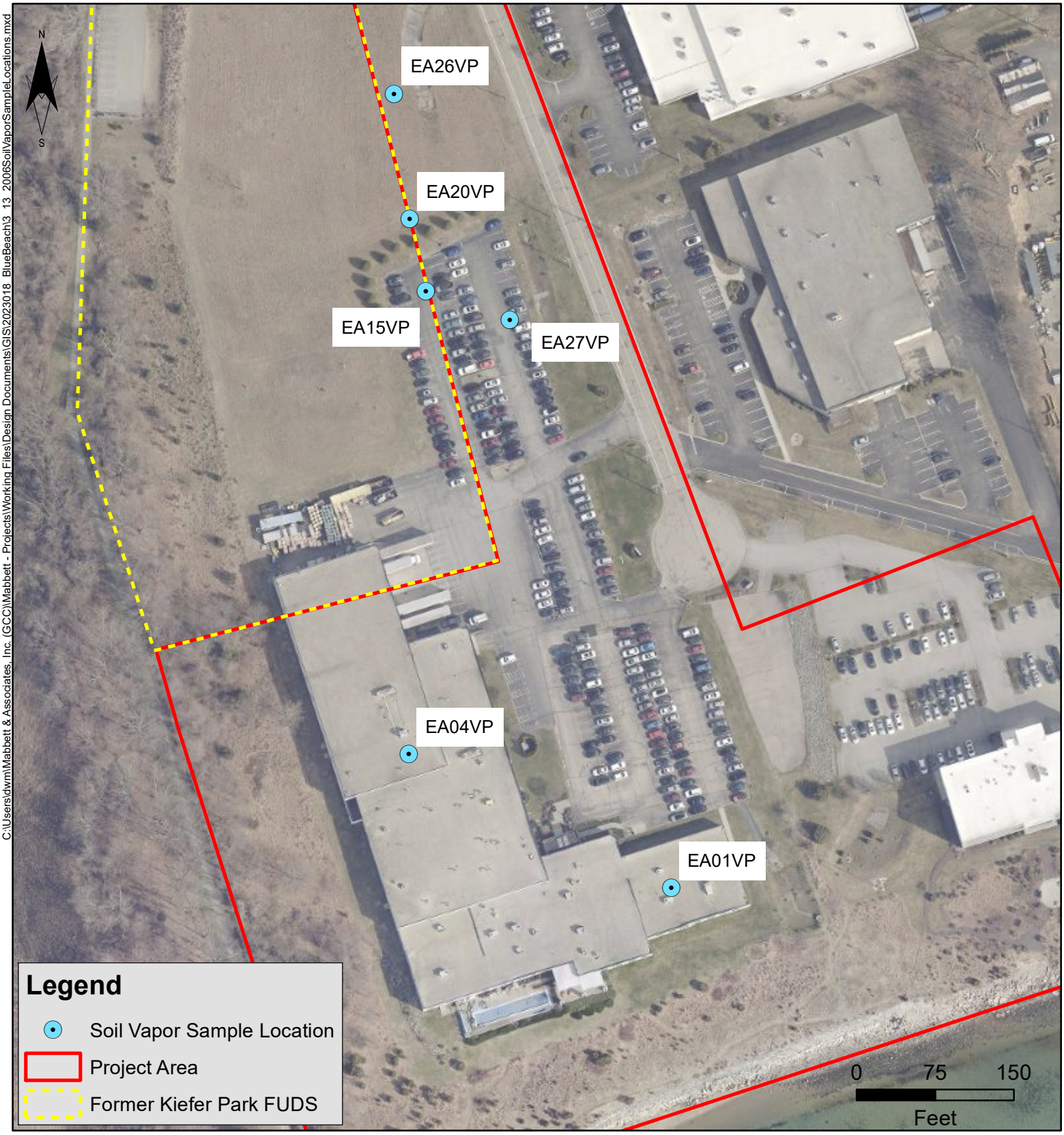

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2006 SOIL VAPOR SAMPLE LOCATIONS

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-13

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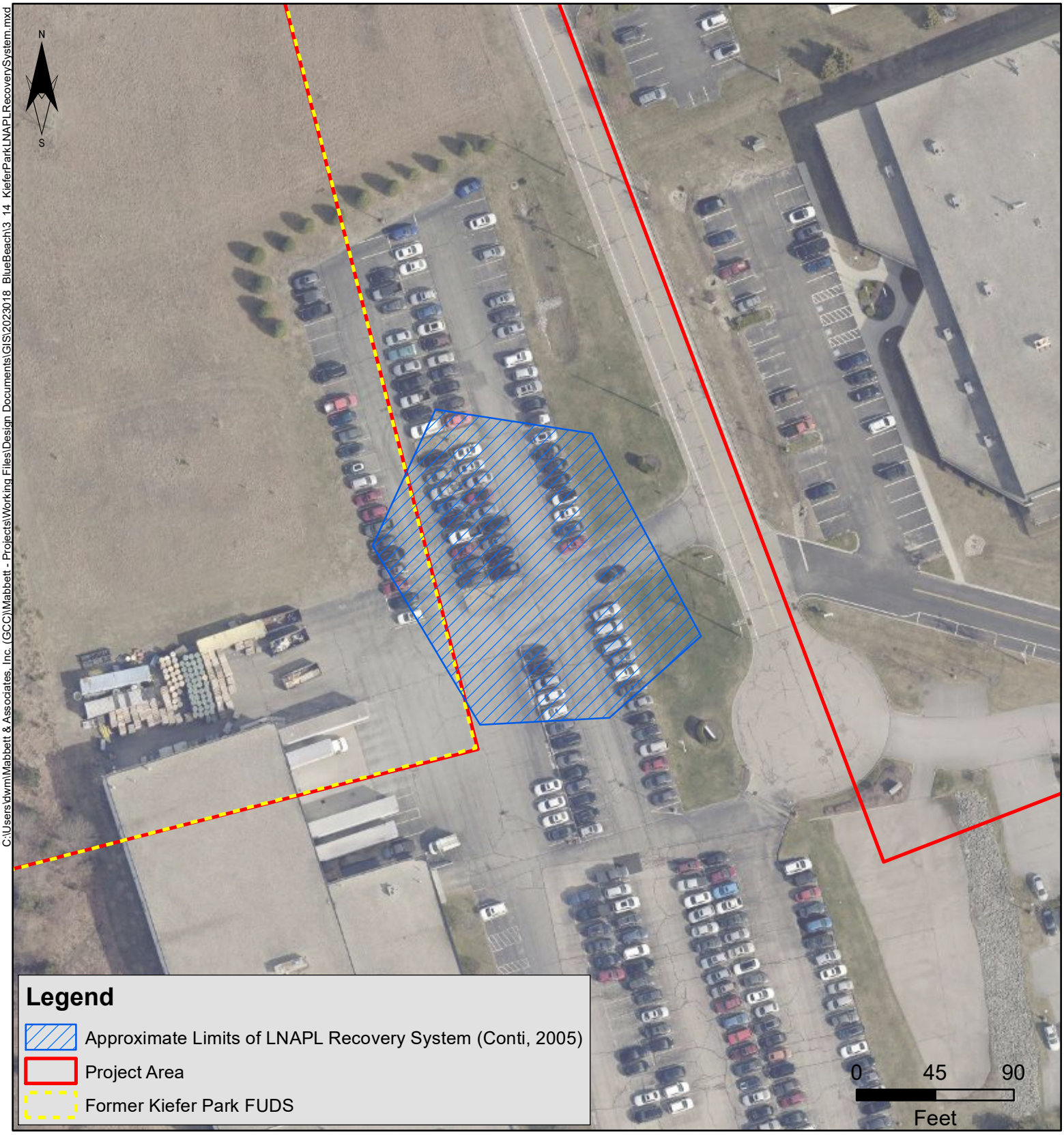

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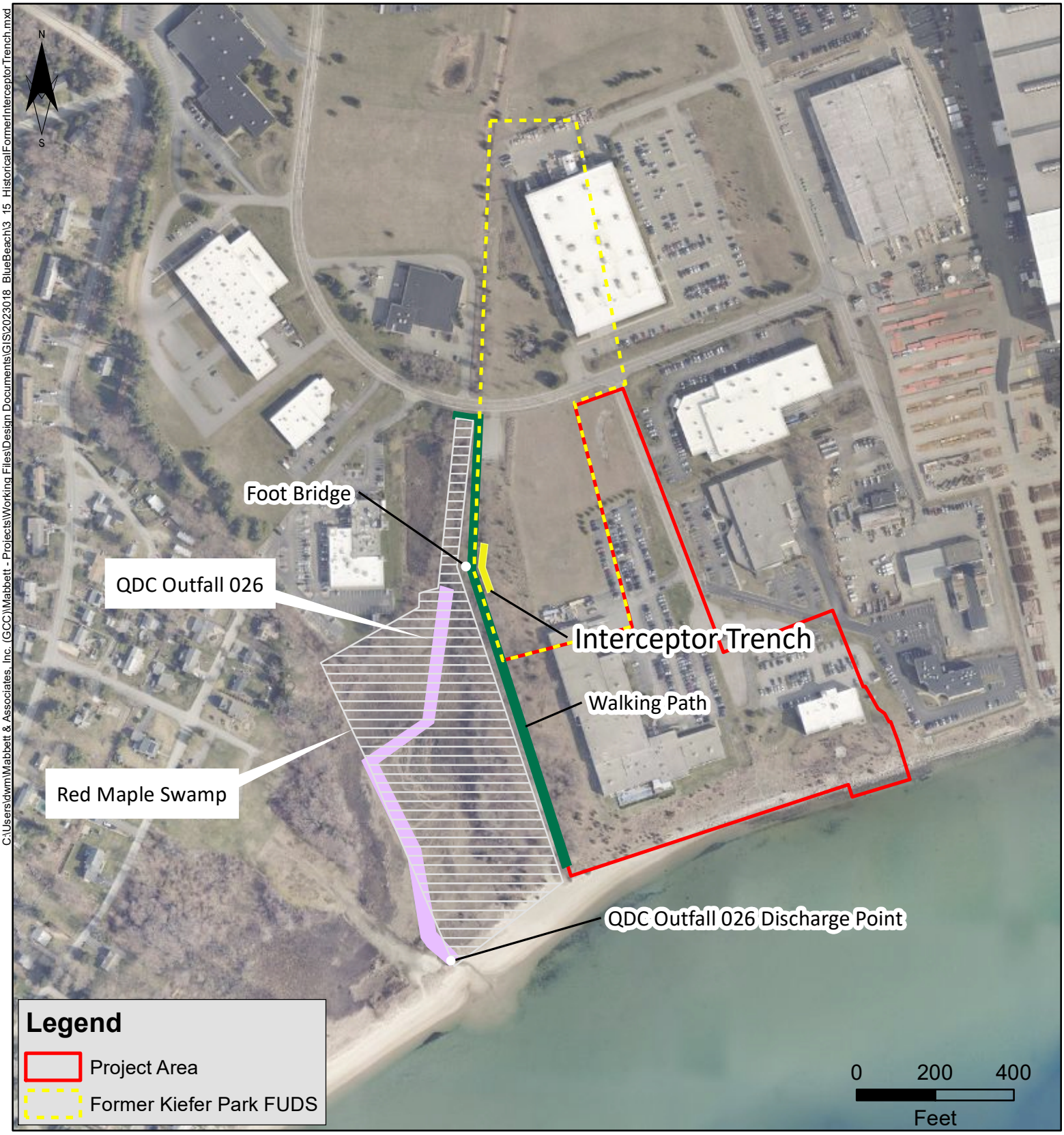
KIEFER PARK FUDS PROJECT
LNAPL RECOVERY SYSTEM
Former Blue Beach Disposal Area
North Kingstown, Rhode Island

Figure 3-14

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024



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HISTORICAL FORMER INTERCEPTOR TRENCH MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-15

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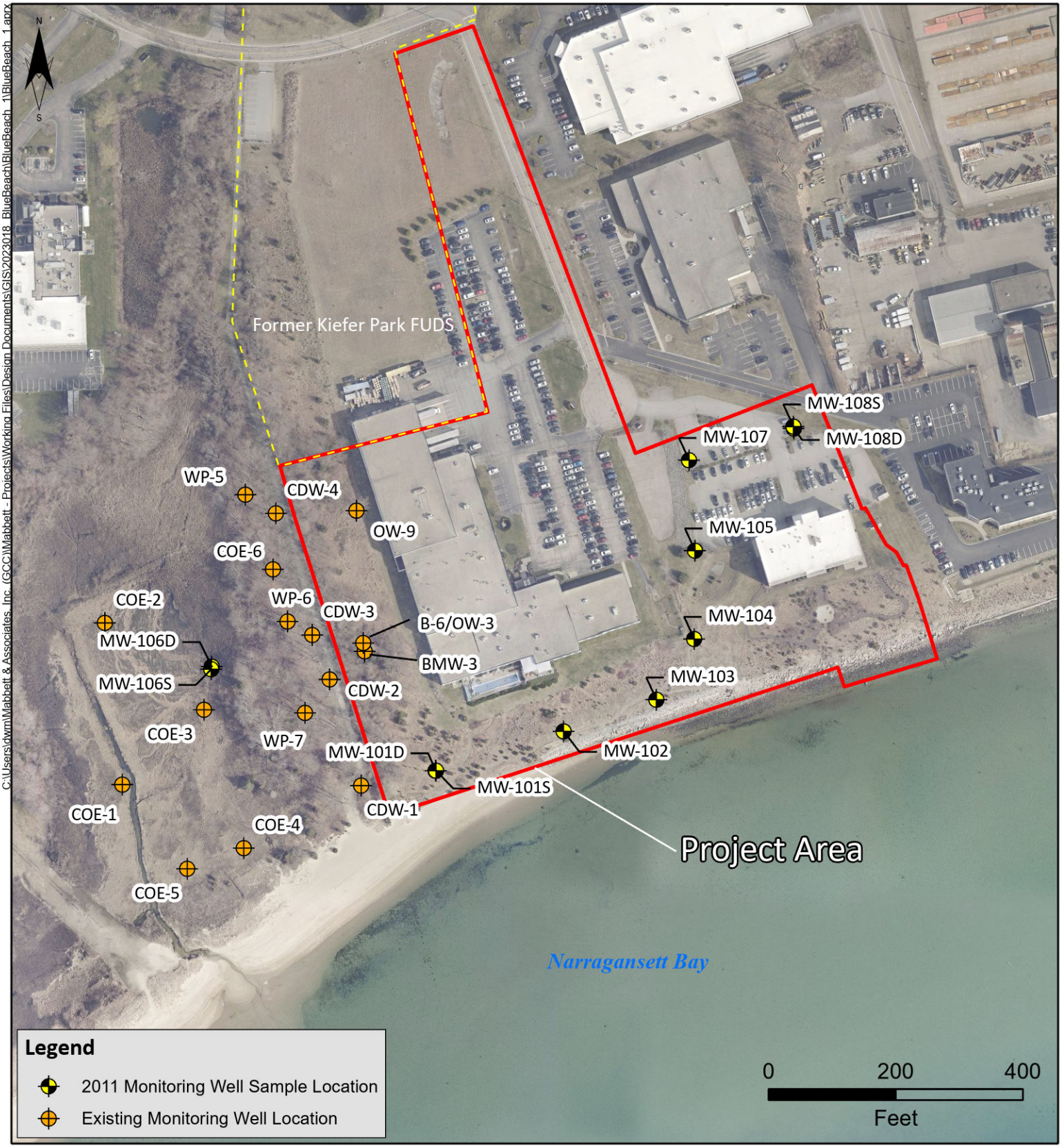

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2011 GROUNDWATER SAMPLE LOCATIONS

Former Blue Beach Disposal Area
North Kingstown, Rhode Island

Figure 3-16

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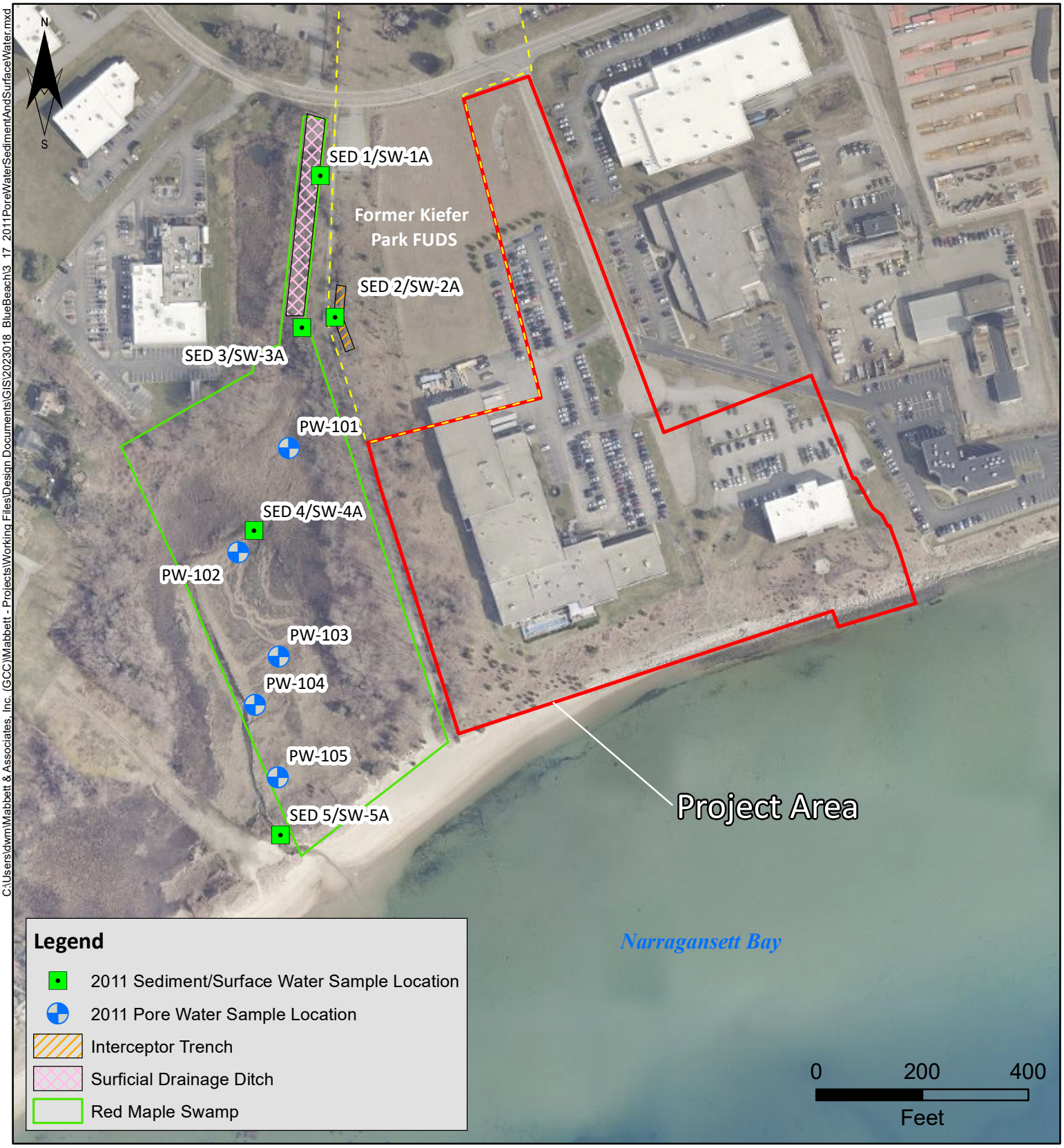

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2011 SEDIMENT, SURFACE WATER AND PORE WATER SAMPLE LOCATIONS

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-17

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Projection: NAD83 RI State Plane (Feet)	
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2011 HYDRIC AND SURFACE SOIL SAMPLE LOCATIONS

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-18

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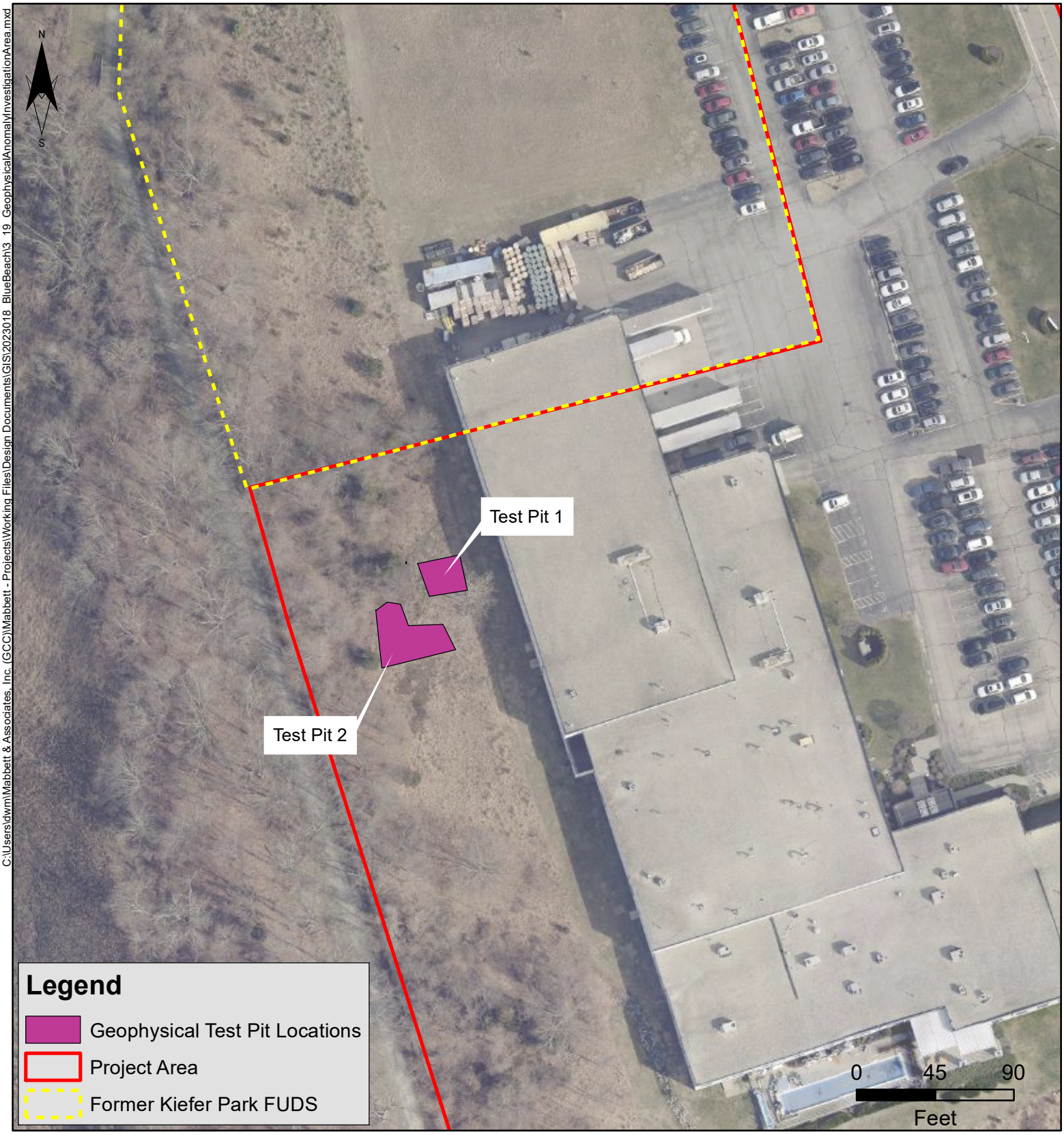

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GEOPHYSICAL ANOMALY INVESTIGATION AREA

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-19

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2014 PORE WATER SAMPLE LOCATIONS

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-20

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Projection: NAD83 RI State Plane (Feet)	
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2014 SEDIMENT AND SURFACE WATER SAMPLE LOCATIONS
Former Blue Beach Disposal Area
North Kingstown, Rhode Island

Figure 3-21

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Projection: NAD83 RI State Plane (Feet)	
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2014 BEACHFRONT SEDIMENT SAMPLE LOCATIONS

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-22

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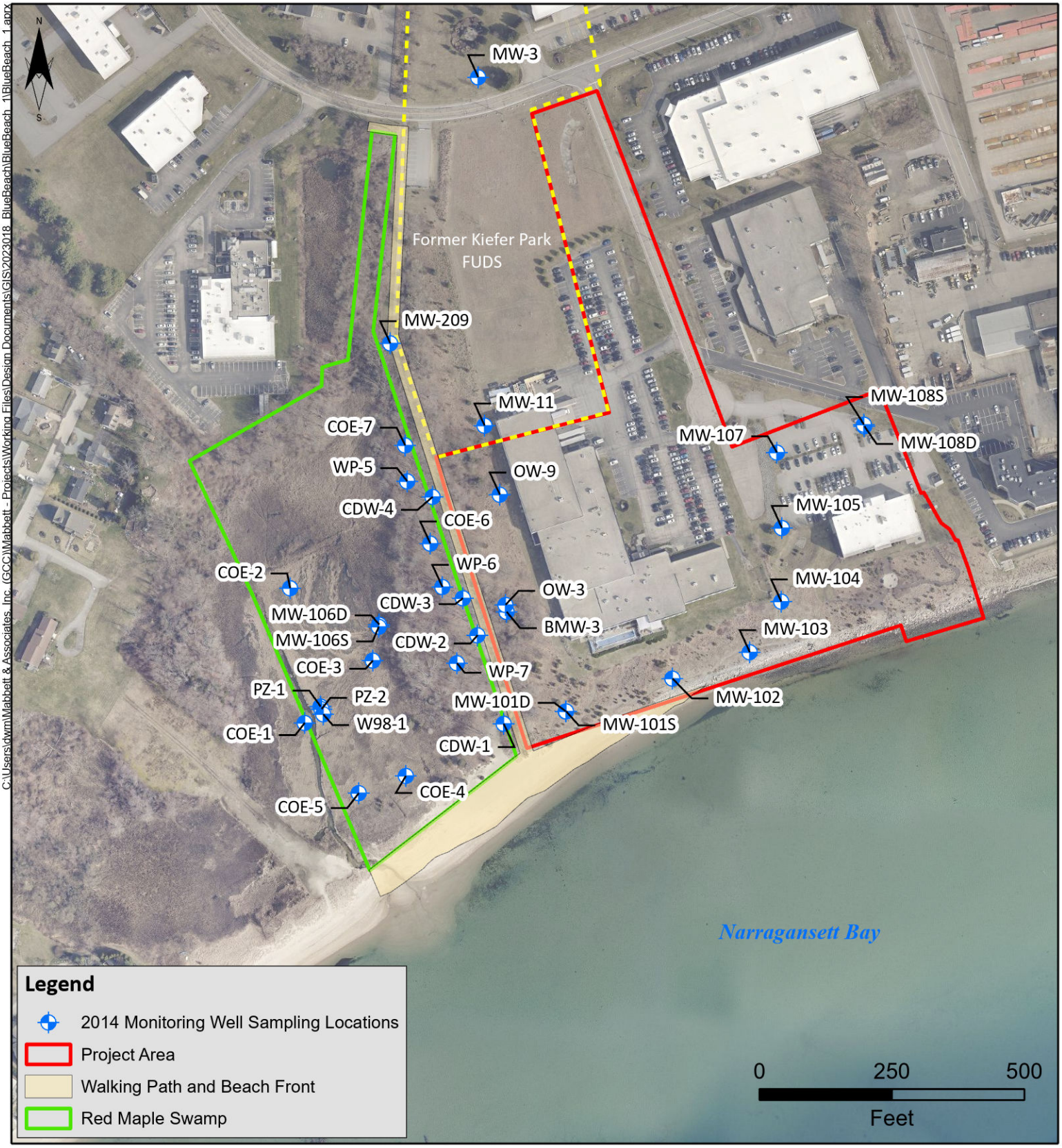

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2014 GROUNDWATER MONITORING WELL SAMPLE LOCATIONS

Former Blue Beach Disposal Area
North Kingstown, Rhode Island

Figure 3-23

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Projection: NAD83 RI State Plane (Feet)	
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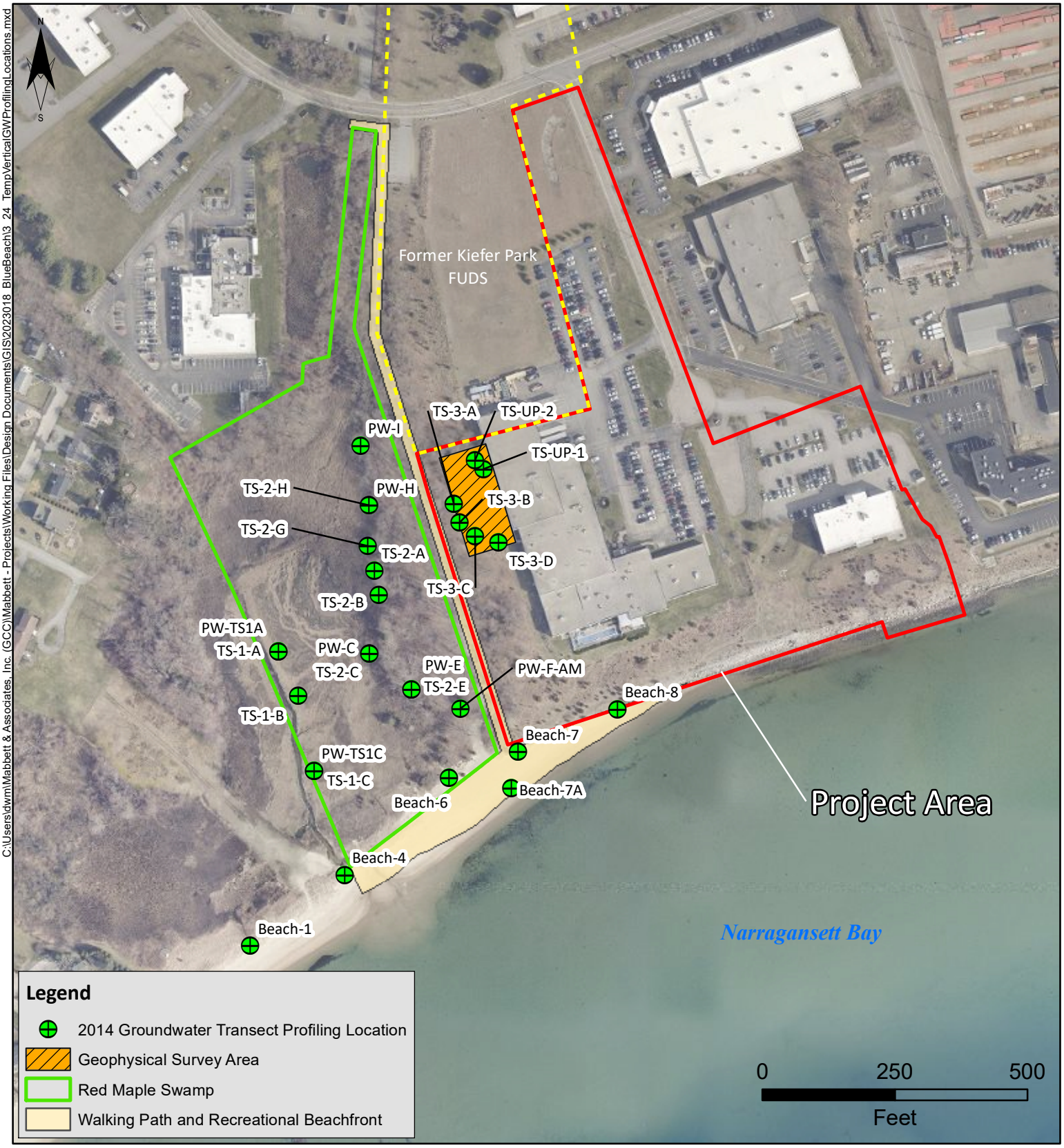

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2014 TEMPORARY VERTICAL GROUNDWATER PROFILING SAMPLE LOCATIONS

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-24

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Projection: NAD83 RI State Plane (Feet)	
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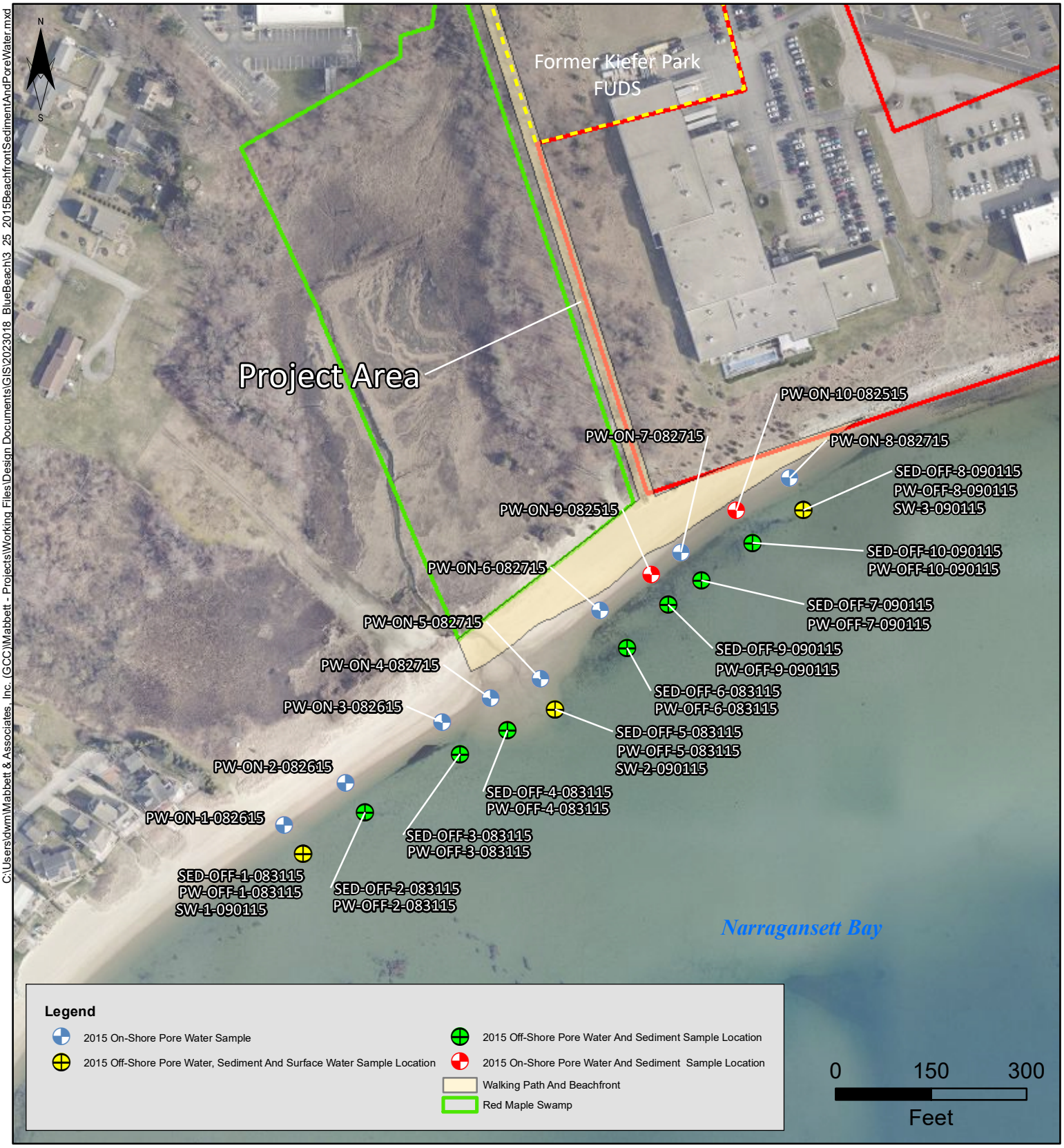

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2015 BEACHFRONT SEDIMENT, PORE WATER AND SURFACE WATER SAMPLE LOCATIONS

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 3-25

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Projection: NAD83 RI State Plane (Feet)	
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Circuit Drive

Stream Between Outfall 025 and Outfall 026

Stream Between Outfall 025 and Narragansett Bay

Walking Path

Whitecap Drive

Project Area

ISM-BG-1

ISM-BG-5

RMS Hydric Soil Area

Upland Soil Sampling Area

ISM-UPS-1 Through ISM-UPS-3
Collected From Upland Soil Sampling Shaded Area

Near-Shore Beachfront

Narragansett Bay

SED-321 SED-322 SED-323 SED-324 SED-325 SED-326 SED-327 SED-328 SED-329 SED-330 SED-331 SED-332 SED-333 SED-334 SED-335 SED-336 SED-337 SED-338 SED-339 SED-340

SB-327 SB-328 SB-329 SB-330 SB-331 SB-332 SB-333 SB-334 SB-335 SB-336 SB-301 SB-302 SB-303 SB-304 SB-305 SB-306 SB-307 SB-308 SB-309 SB-310 SB-311 SB-312 SB-313 SB-314 SB-315 SB-316 SB-317 SB-318 SB-319 SB-320 SB-321 SB-322 SB-323 SB-324 SB-325 SB-326 SB-BG-1

SSH-301 SSH-302 SSH-303 SSH-304 SSH-305 SSH-306 SSH-307 SSH-308 SSH-309 SSH-310

SED-301 SED-302 SED-303 SED-304 SED-305 SED-306 SED-307 SED-308 SED-309 SED-310

Legend

- Sediment Soil Sample Location
- Hydric Soil Sample Location
- Soil Sample Location
- Sediment And Toxicity Soil Sample Location

0 250 500
Feet

2019 SAMPLE LOCATION MAP
Former Blue Beach Disposal Area
North Kingstown, Rhode Island

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Figure 3-26

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2019 GROUNDWATER SAMPLE LOCATION MAP

Former Blue Beach Disposal Area
North Kingstown, Rhode Island

Figure 3-27

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2020 OFF-SITE BACKGROUND SAMPLE LOCATION MAP
Former Blue Beach Disposal Area
North Kingstown, Rhode Island

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Figure 3-28

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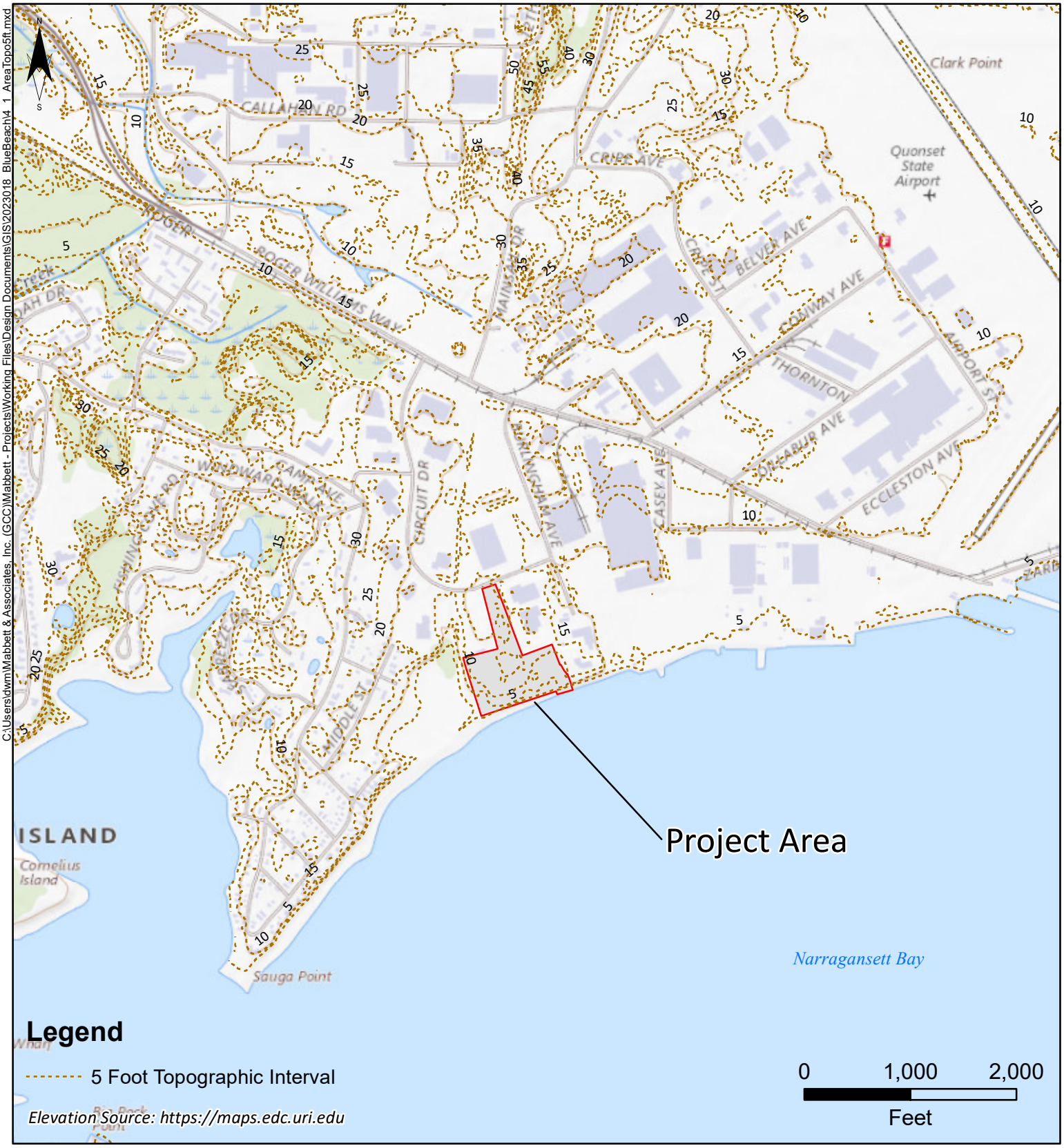

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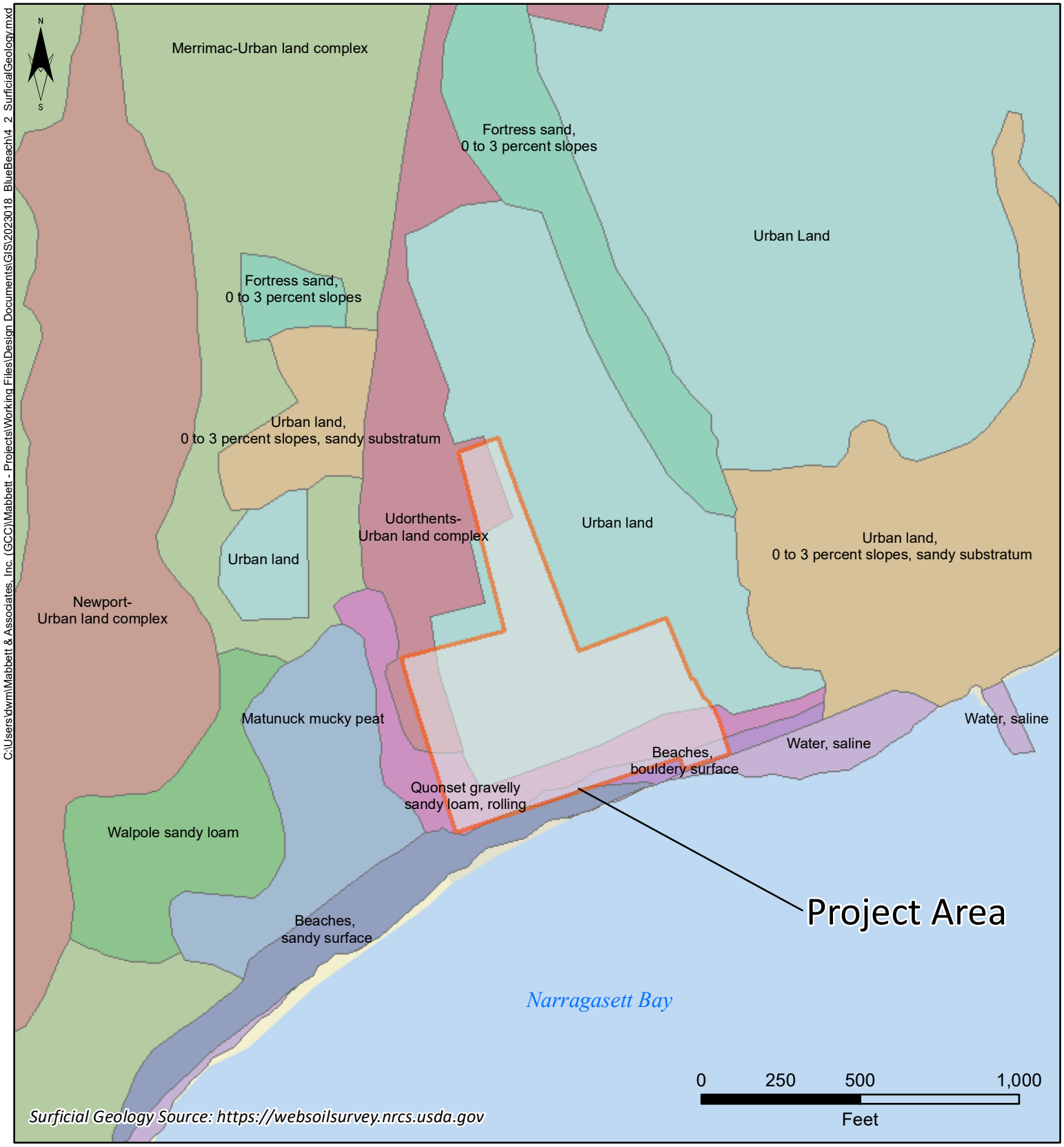
AREA TOPOGRAPHIC MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 4-1

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024



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SURFICIAL GEOLOGY MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 4-2

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024

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SITE TOPOGRAPHIC MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 4-3

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024

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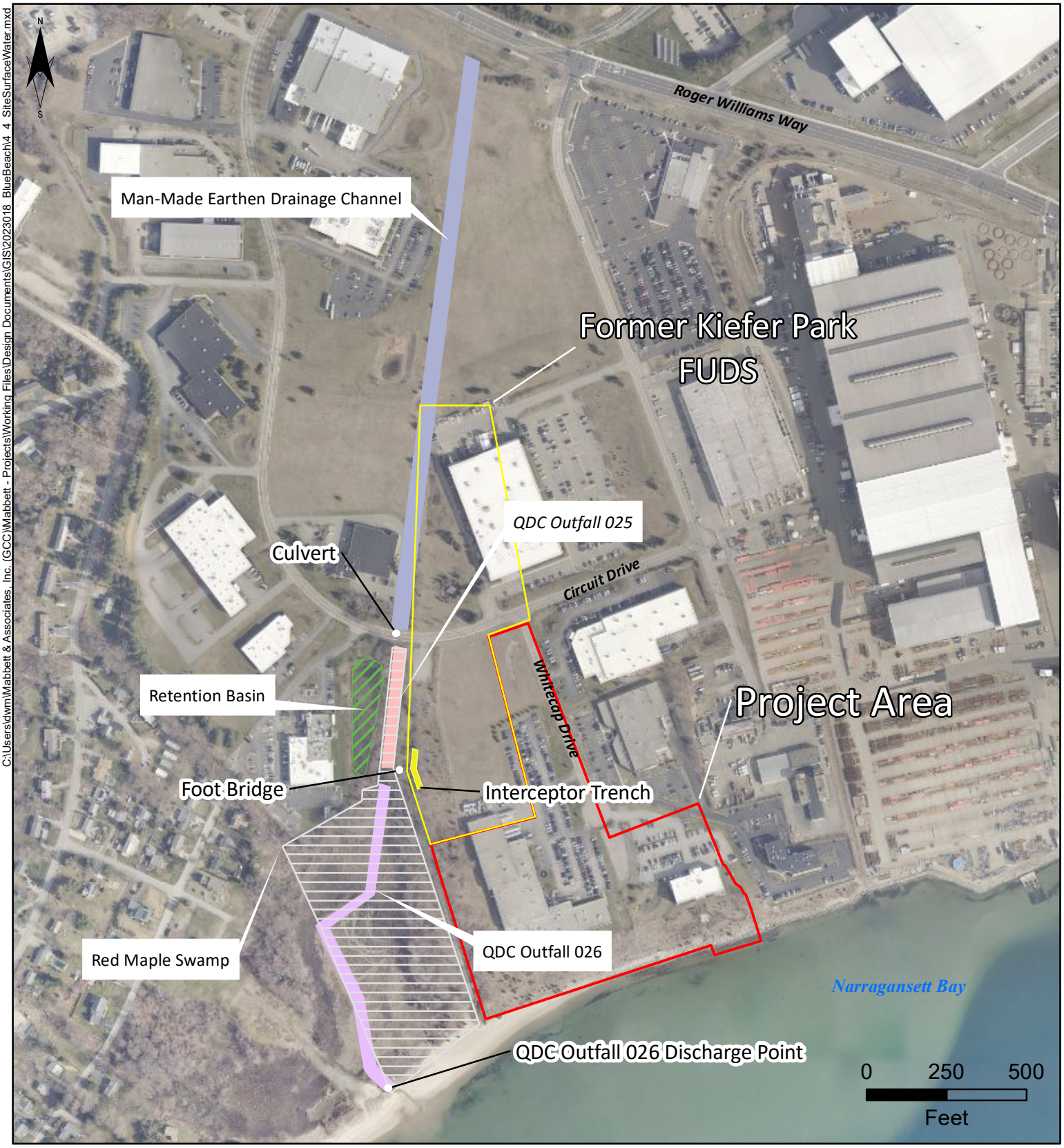

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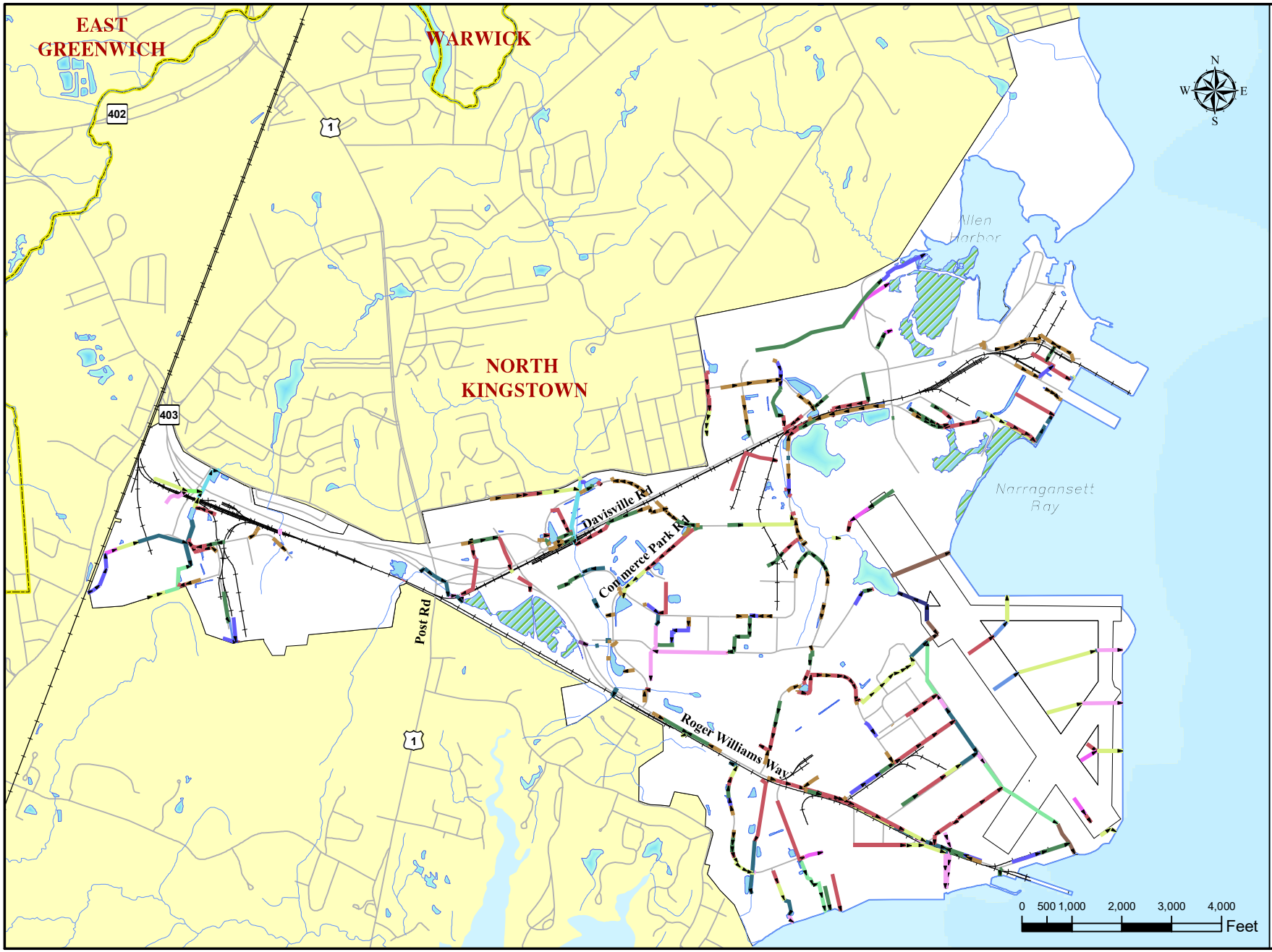
SITE SURFACE WATER MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 4-4

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024



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North Kingstown, RI 02852
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RIGIS

Legend

Storm Size

- 2'x4'
- 3'x3'
- 6'x3'
- 12"
- 15"
- 18"
- 21"
- 24"
- 27"
- 30"
- 36"
- 42"
- 48"
- 54"
- 60"
- Wetlands
- Storm Detention Areas

NO.	REVISION	DATE	APP.

DESIGN BY: CHECKED BY:
DRAWN BY: ENGINEER:
SCALE: PROJECT NO.:
CONTRACT NO.:
FILE NAME:

APPROVED

Q.D.C., MANAGING DIRECTOR

DATE 00-00-00

DRAWING TITLE

FIGURE 4-5

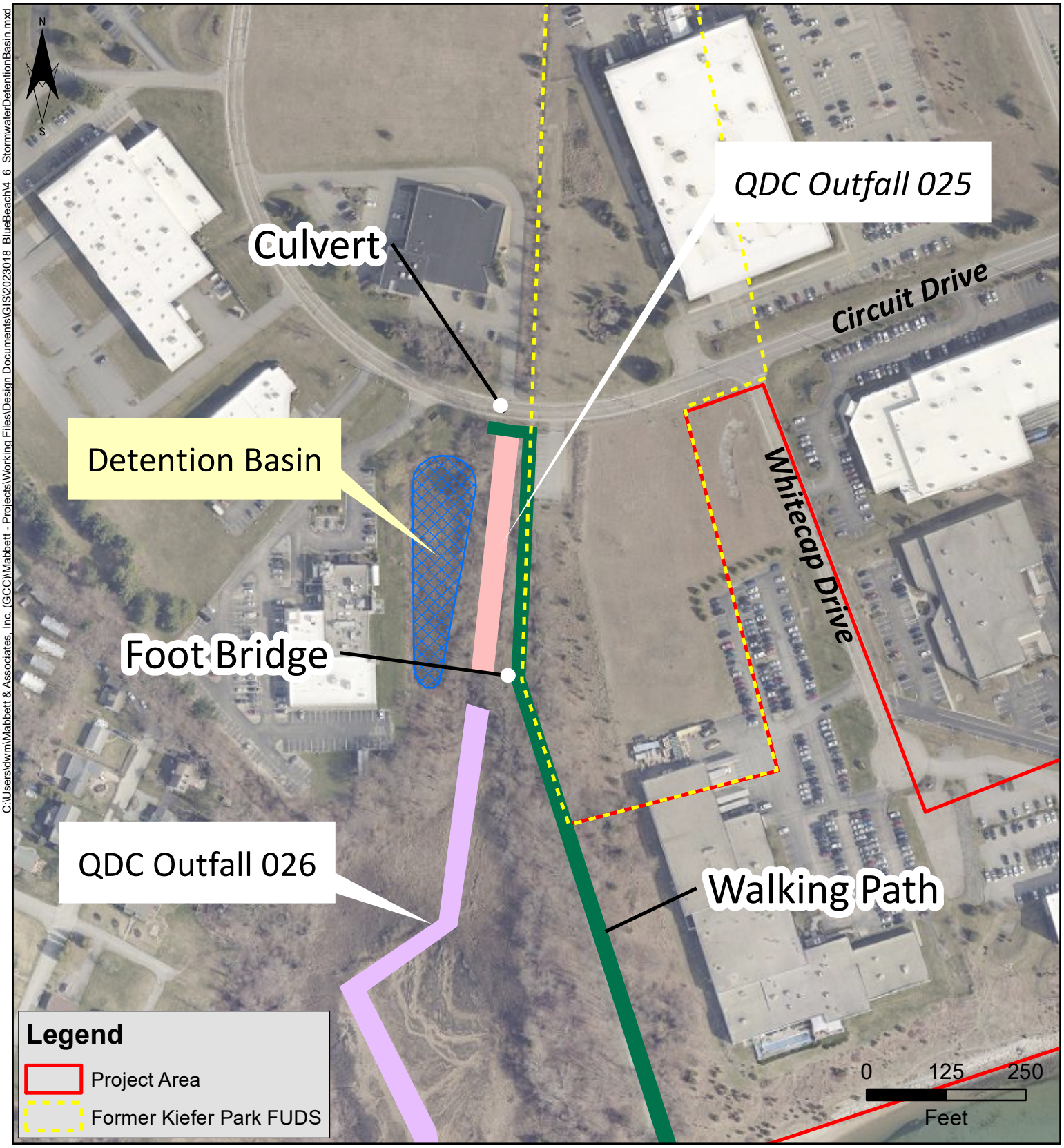
MASTER LAND USE AND DEVELOPMENT PLAN

STORMWATER & DRAINAGE SYSTEM

Quonset Business Park®

SHEET NO.: *4-5*

DRAWING NO.:



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CIRCUIT DRIVE DRAINAGE ASSOCIATION
STORMWATER DETENTION BASIN PLAN
Former Blue Beach Disposal Area
North Kingstown, Rhode Island

Figure 4-6

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
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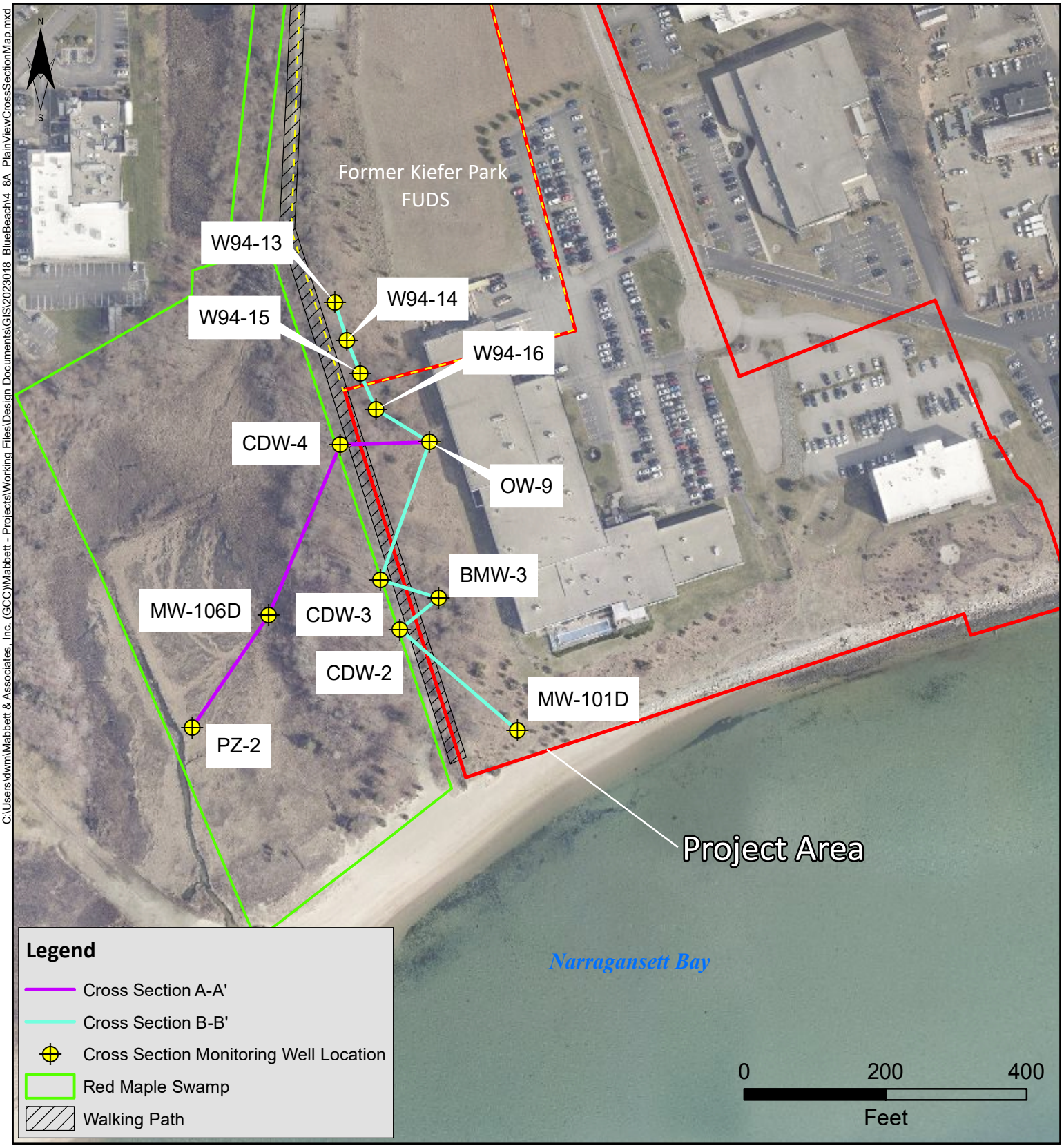
REGIONAL BEDROCK GEOLOGY MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 4-7

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024



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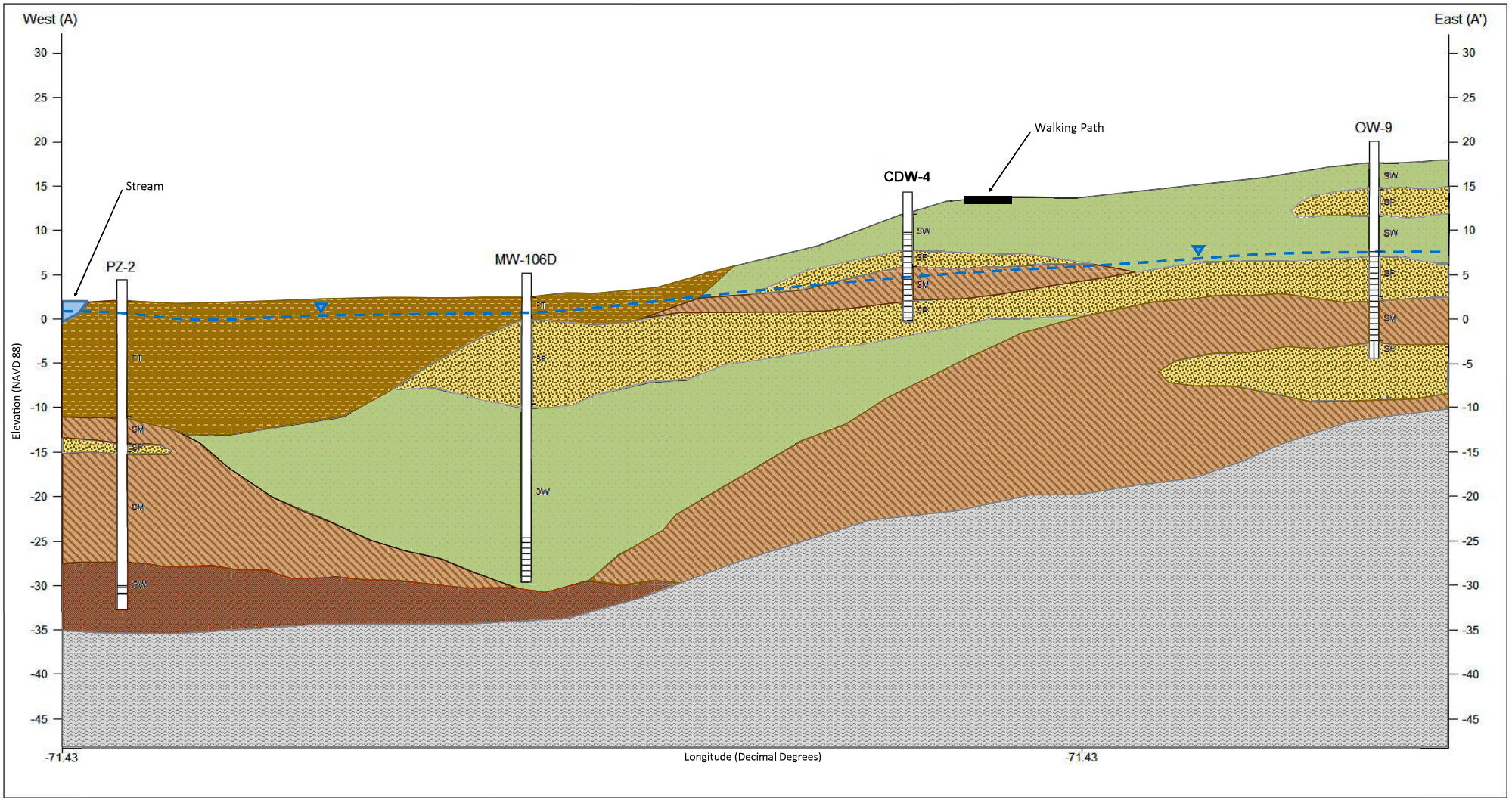
PLAN VIEW
CROSS SECTION MAP
Former Blue Beach Disposal Area
North Kingstown, Rhode Island

Figure 4-8A

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024



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A-A' Cross Section

Blue Beach FUDS

Figure No. 4-8B

Scale: NA

Drawn: MJH Approved: AMG

Projection: NA

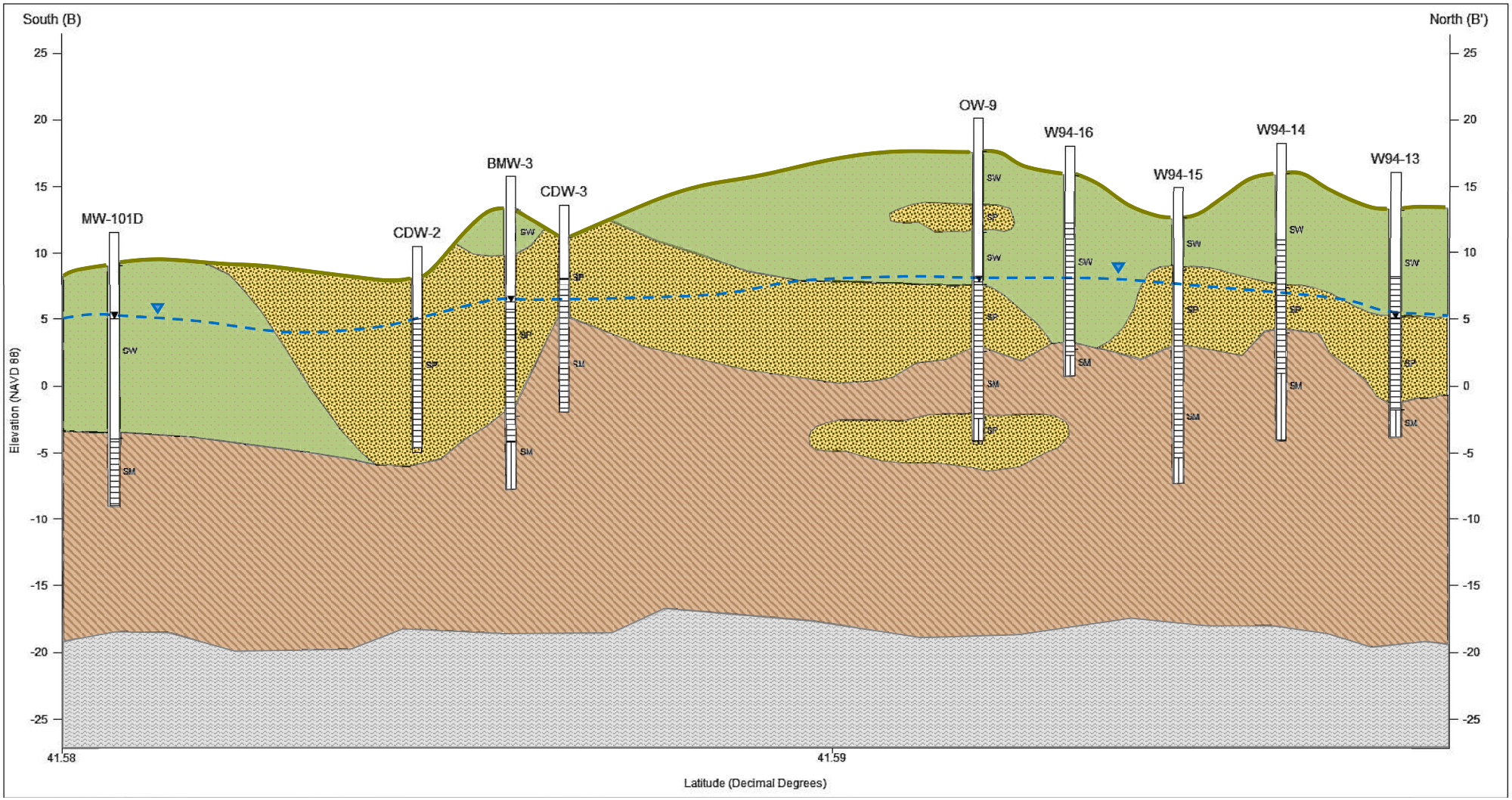
Date: 2/1/2024

Legend

- Bedrock
- SM—Silty Sand
- SW—Well Graded Sand
- SP — Poorly Graded Sand
- PT — Peat, organic sand
- Gravel — Poorly Graded Gravel

NOTES:

- Depth to bedrock is assumed based on nearby borings not included in this cross section.
- Stratigraphy presented above in between wells is an approximation



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B-B Cross Section

Blue Beach FUDS

Figure No. 4-8C

Scale: NA

Drawn: MJH Approved: AMG

Projection: NA

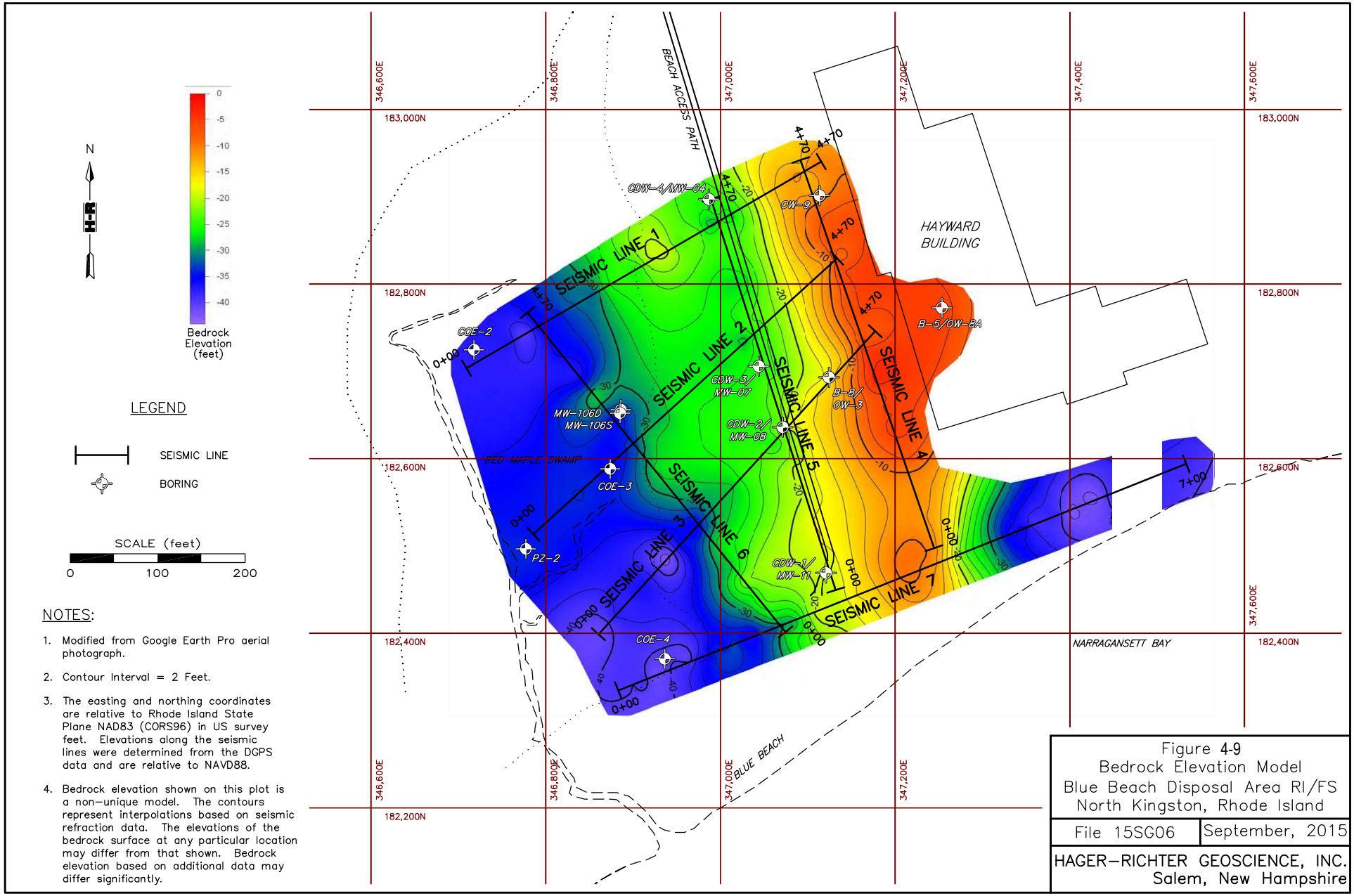
Date: 2/1/2024

Legend

- Bedrock
- SM—Silty Sand
- SW—Well Graded Sand
- SP — Poorly Graded Sand

NOTES:

- Depth to bedrock is assumed based on nearby borings not included in this cross section.
- Stratigraphy presented above in between wells is an approximation



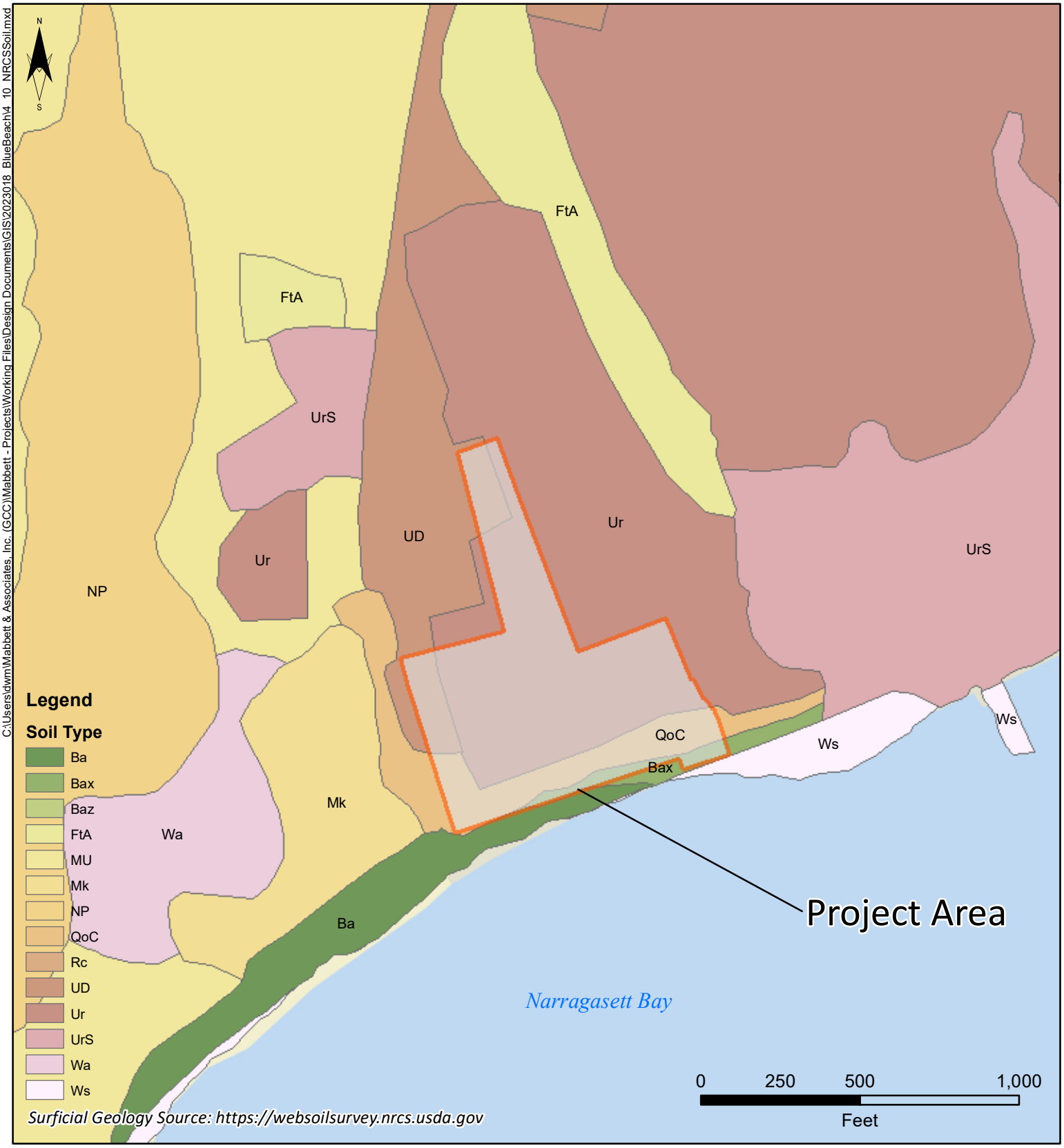
NOTES:

1. Modified from Google Earth Pro aerial photograph.
2. Contour Interval = 2 Feet.
3. The easting and northing coordinates are relative to Rhode Island State Plane NAD83 (CORS96) in US survey feet. Elevations along the seismic lines were determined from the DGPS data and are relative to NAVD88.
4. Bedrock elevation shown on this plot is a non-unique model. The contours represent interpolations based on seismic refraction data. The elevations of the bedrock surface at any particular location may differ from that shown. Bedrock elevation based on additional data may differ significantly.

Figure 4-9
Bedrock Elevation Model
Blue Beach Disposal Area RI/FS
North Kingston, Rhode Island

File 15SG06 | September, 2015

HAGER-RICHTER GEOSCIENCE, INC.
Salem, New Hampshire



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NRCS SOIL MAP

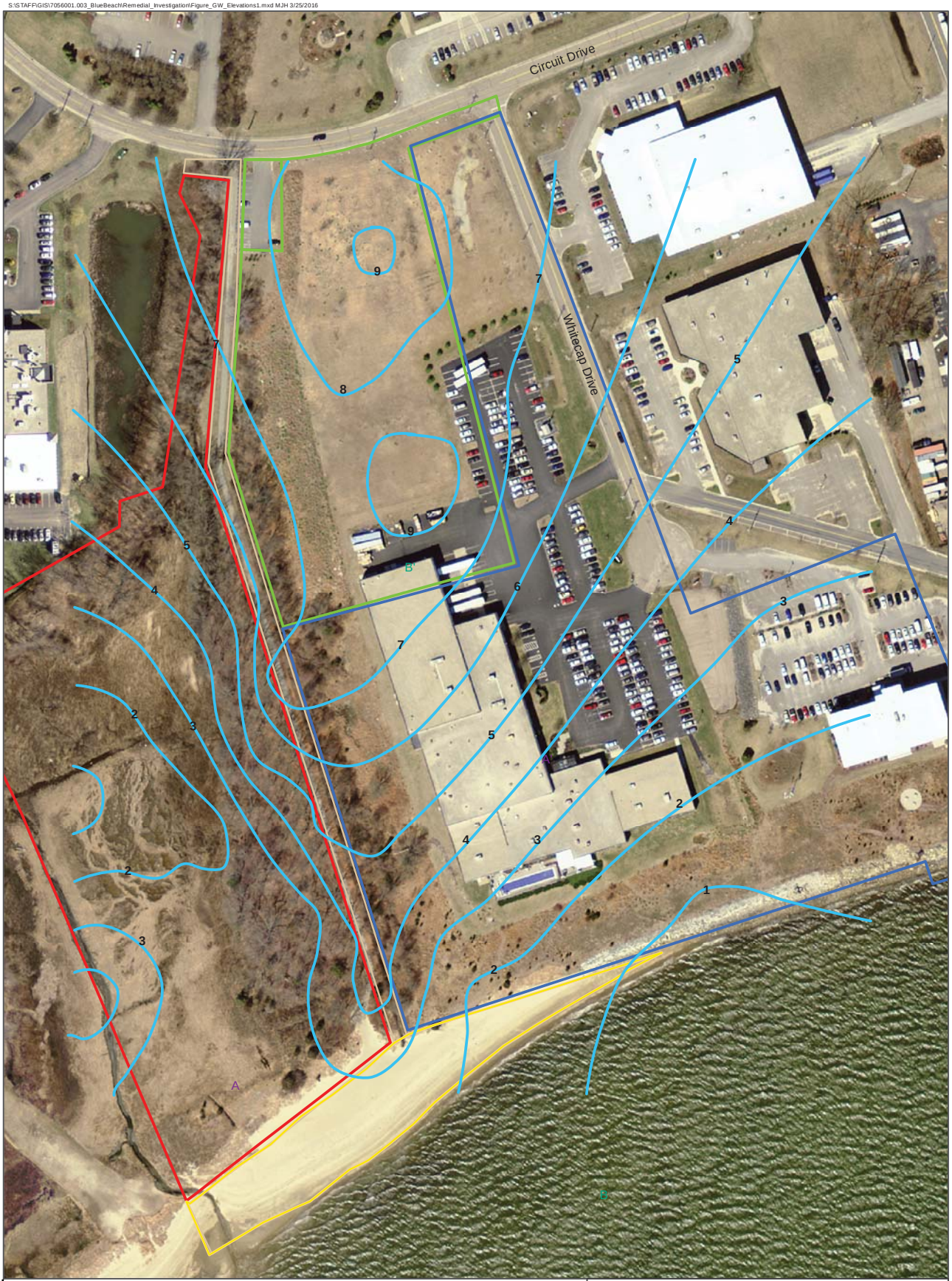
Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 4-10

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024

S:\STAFF\GIS\7056001.003_BlueBeach\Remedial_Investigation\Figure_GW_Elevations1.mxd MJH 3/25/2016



Legend

- Beach Front
- Blue Beach FUDS
- Walking Path
- Red Maple Swamp
- Kiefer Park FUDS

Note: Groundwater Elevations collected on December 4, 2011
Source: Half foot Digital Ortho Imagery collected by Sky Research 2007 Horizontal Projection NAD83 State Plane Rhode Island Elevations

0 75 150 300 Feet

2011 GROUNDWATER POTENTIOMETRIC FLOW MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

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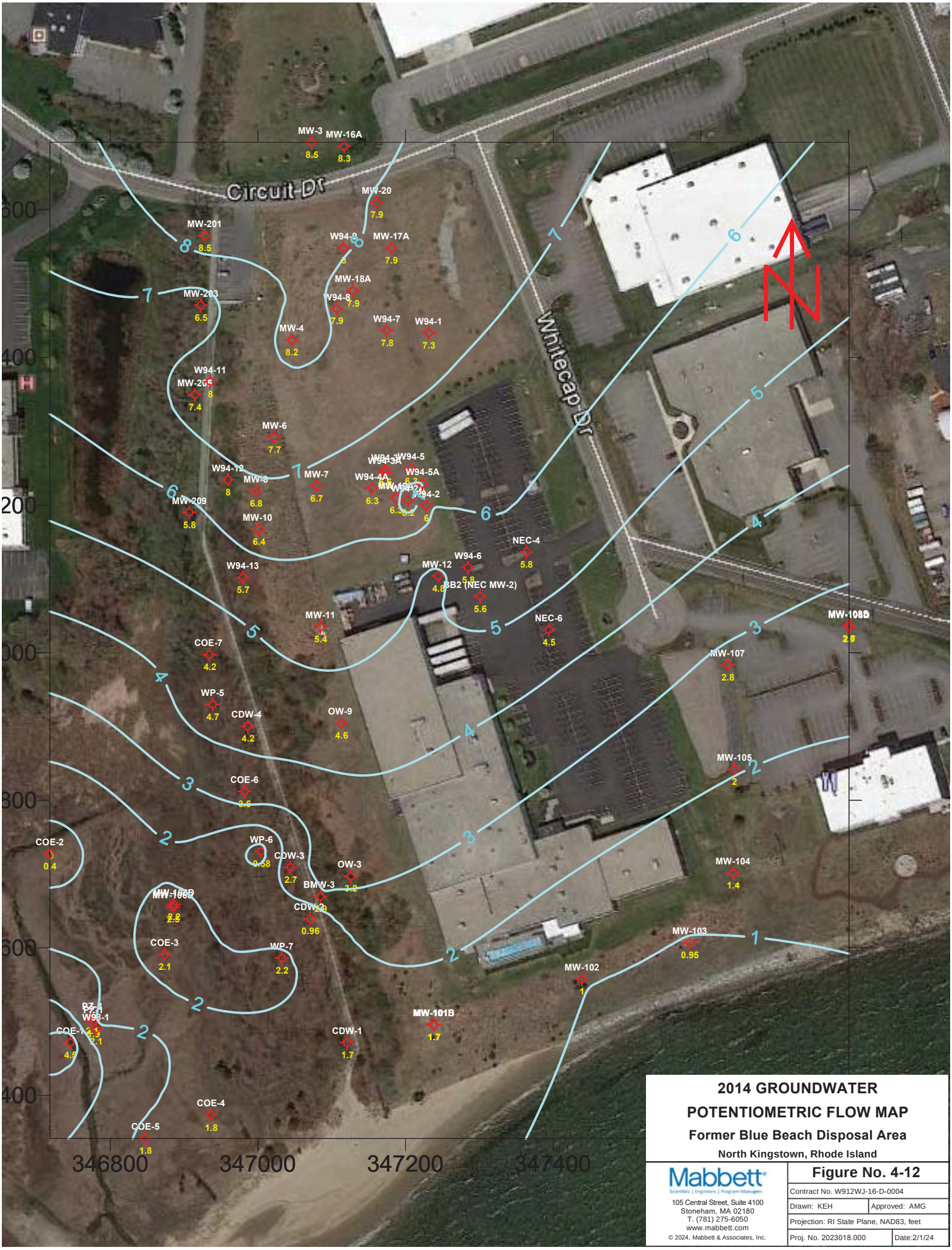
Figure No. 4-11

Contract No. W912WJ-16-D-0004	
Drawn: KEH	Approved: AMG
Projection: RI State Plane, NAD83, feet	
Proj. No. R2023018.000	Date:2/1/24



2014 GROUNDWATER POTENTIOMETRIC FLOW MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure No. 4-12

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Drawn: KEH	Approved: AMG
Projection: RI State Plane, NAD83, feet	
Proj. No. 2023018.000	Date:2/1/24

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2019 GROUNDWATER ELEVATION MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 4-13

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024

EAST GREENWICH

WARWICK

NORTH KINGSTOWN

402

1

403

1

Davisville Rd

Commerce Park Rd

Post Rd

Roger Williams Way

Available

Available

Calf Pasture Beach

Allen Harbor

North Kingstown Marina

Spink's Neck Beach

Narragansett Bay

Compass Rose Beach

Blue Beach

N

W

E

S

0 500 1,000 2,000 3,000 4,000 Feet

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Technical Support Services
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North Kingstown, RI 02852
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Cartography by Antonio Ambrosio, Quonset Development Corporation N. Kingstown, Rhode Island.
Map produced 2018.

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Legend

- QAD — Quonset Airport District
- QMUDD — Quonset Mixed Use Development District
- QOSCD — Quonset Open Space and Conservation District
- QGID — Quonset General Industrial District
- QLID — Quonset Light Industrial District
- QPRD — Quonset Public and Recreation District
- QWD — Quonset Waterfront District
- Rail/ROW

NO.	REVISION	DATE	APP.

DESIGN BY	CHECKED BY
DRAWN BY	ENGINEER
SCALE	PROJECT NO.
CONTRACT NO.	
FILE NAME	

APPROVED

Q.D.C. MANAGING DIRECTOR

DATE 00-00-00

DRAWING TITLE

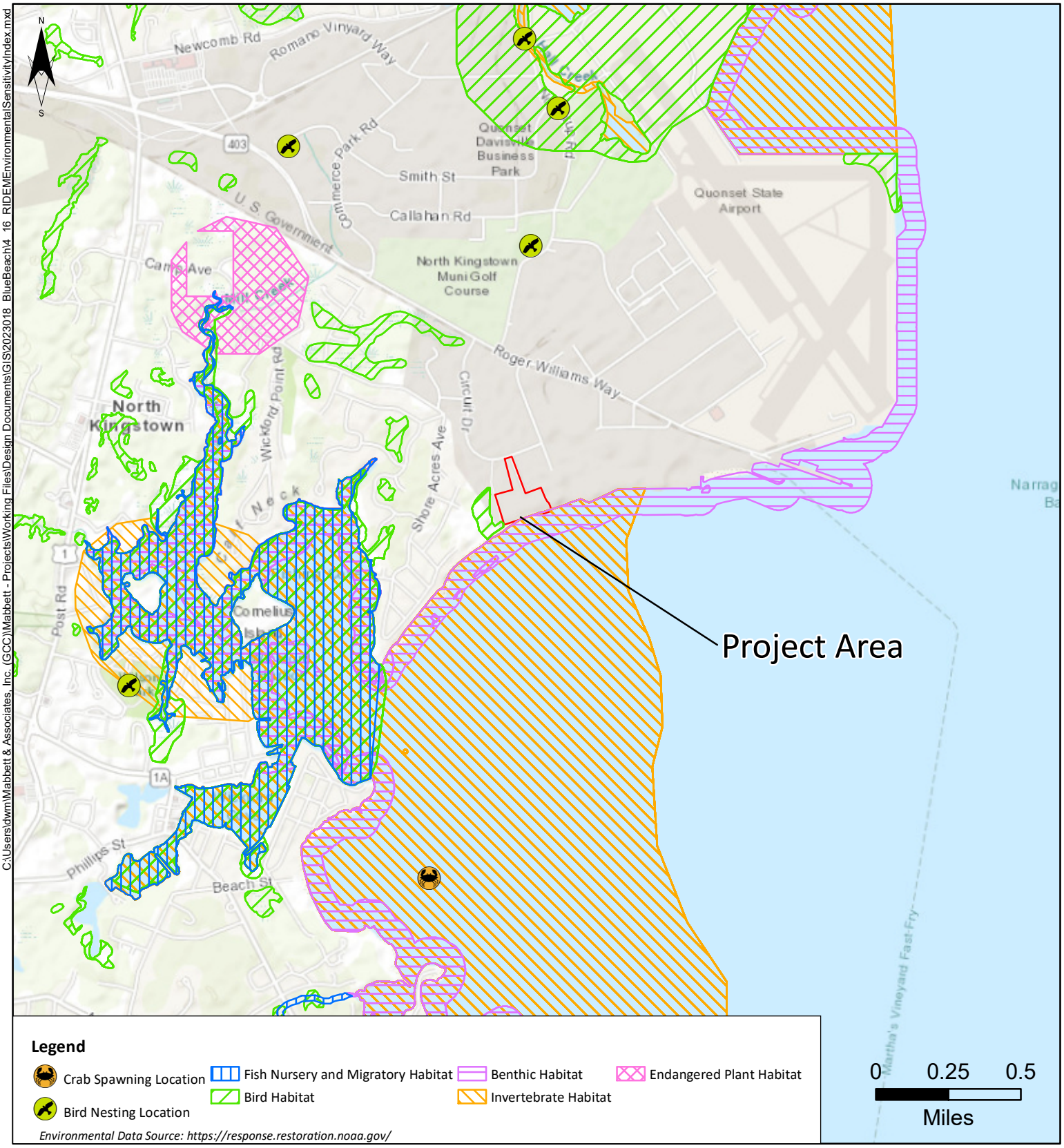
FIGURE 4-14

MASTER LAND USE AND DEVELOPMENT PLAN

LAND USE

Quonset Business Park®

SHEET NO.	DRAWING NO.
4-14	



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ENVIRONMENTAL SENSITIVITY INDEX MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 4-15

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
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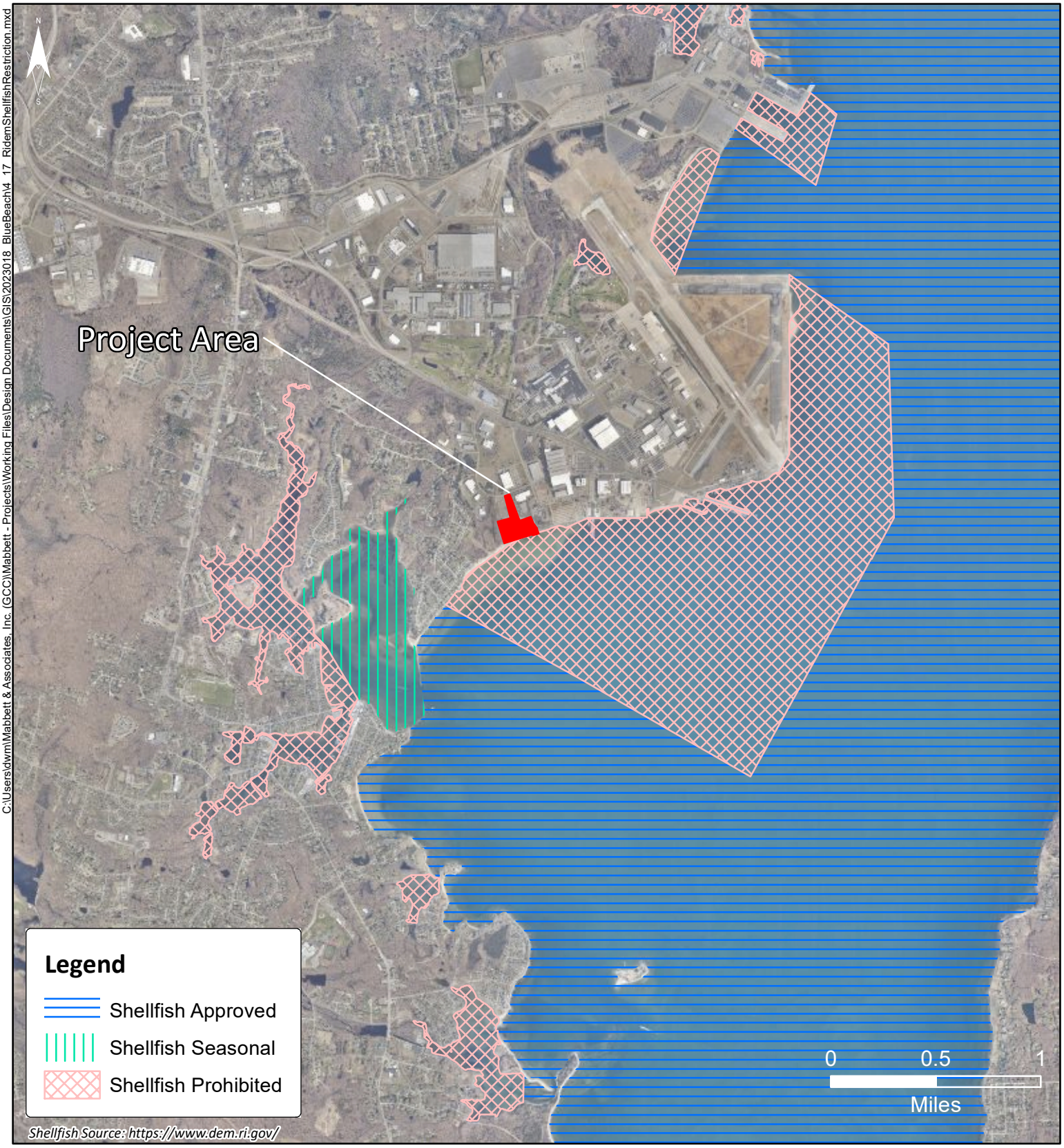
BIODIVERSITY RESOURCE MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 4-16

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024



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RIDEM SHELLFISH RESTRICTION MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 4-17

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
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FOREST AND WETLAND RESOURCE MAP

Former Blue Beach Disposal Area

North Kingstown, Rhode Island

Figure 4-18

Drawn: DWM	Approved: SAV
Projection: NAD83 RI State Plane (Feet)	
Proj. No. R2023018.000	Date: 2/1/2024

Former Blue Beach Disposal Area FUDS

SUMMARY OF ANTIMONY DETECTED IN ON-PROJECT SURFACE SOIL

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-1A

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Project No. R2023018.000.003	Date: 2/1/2024

SB-306 (1-3)
0.130

SB-304 (1-3)
0.179

SB-305 (1-3)
0.212

SB-BG (1-3)
3.750

SB-307 (1-3)
0.084

SB-301 (2-6)
0.110

SB-303 (1-3)
0.140 J

SB-302 (1-3)
0.036 J

SB-308 (1-3)
0.467

SB-310 (1-3)
0.085

SB-326 (1-3)
0.022 J

SB-322 (1-3)
1.120

SB-324 (1-3)
0.087

SB-325 (1-3)
0.030 J

SB-320 (1-3)
0.043 J

SB-323 (1-3)
0.048 J

SB-311 (1-3)
0.164

SB-318 (1-3)
0.038 U

SB-321 (1-3)
0.170

SB-316 (1-3)
0.035 J

SB-319 (1-3)
0.110

SB-317 (1-3)
0.017 J

SB-312 (1-3)
0.049 J

SB-314 (1-3)
0.056 J

SB-315 (1-3)
0.026 J

SB-313 (1-3)
0.100

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Numbers in parentheses represent sample depth interval.

Former Blue Beach Disposal Area FUDS

SUMMARY OF ANTIMONY DETECTED IN ON-PROJECT SUBSURFACE SOIL

North Kingstown, Rhode Island

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Figure 5-1B

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Former Blue Beach Disposal Area FUDS

SUMMARY OF ANTIMONY DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-1C

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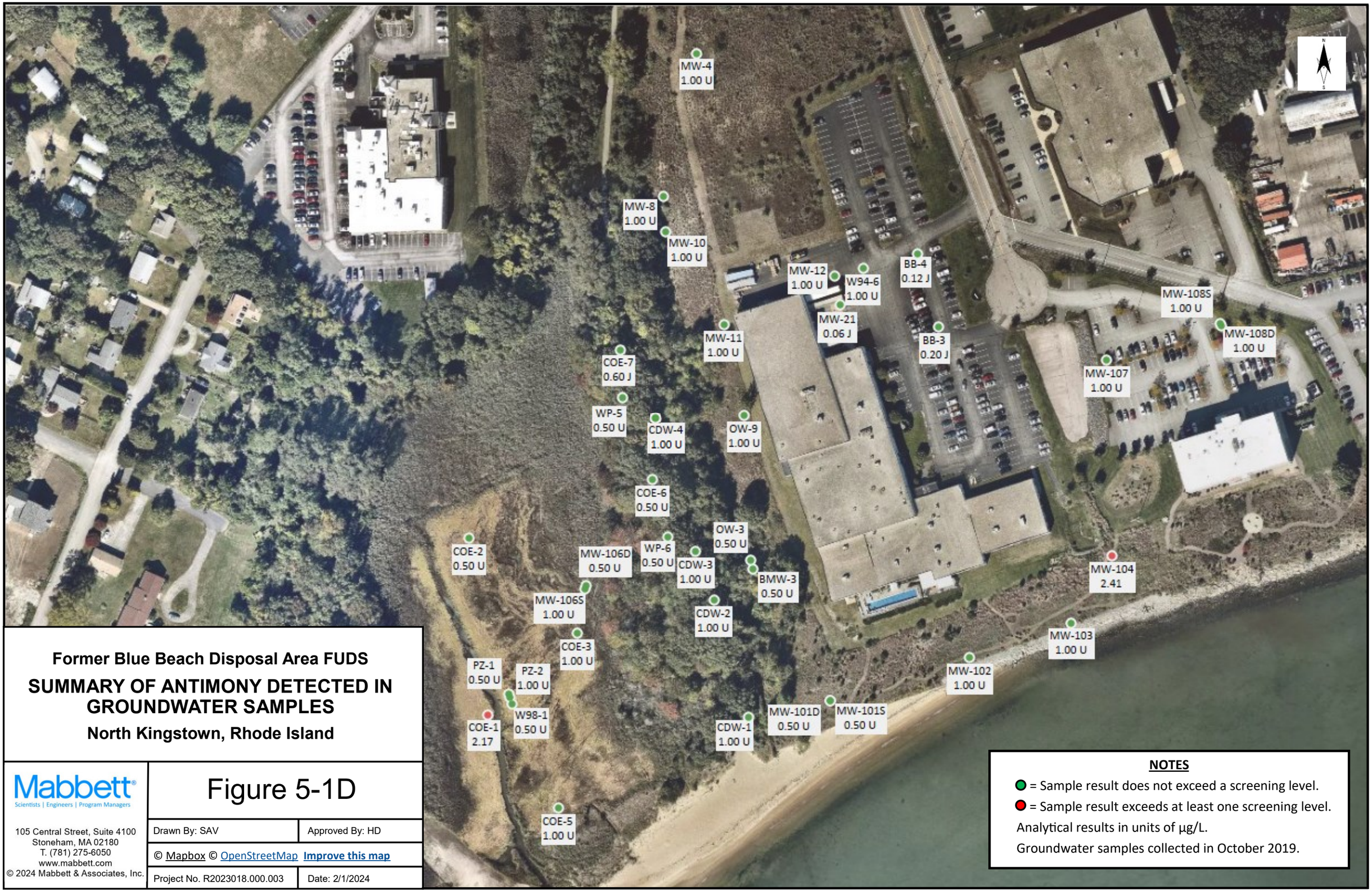

Former Blue Beach Disposal Area FUDS

SUMMARY OF ANTIMONY DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Groundwater samples collected in October 2019.

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Figure 5-1D

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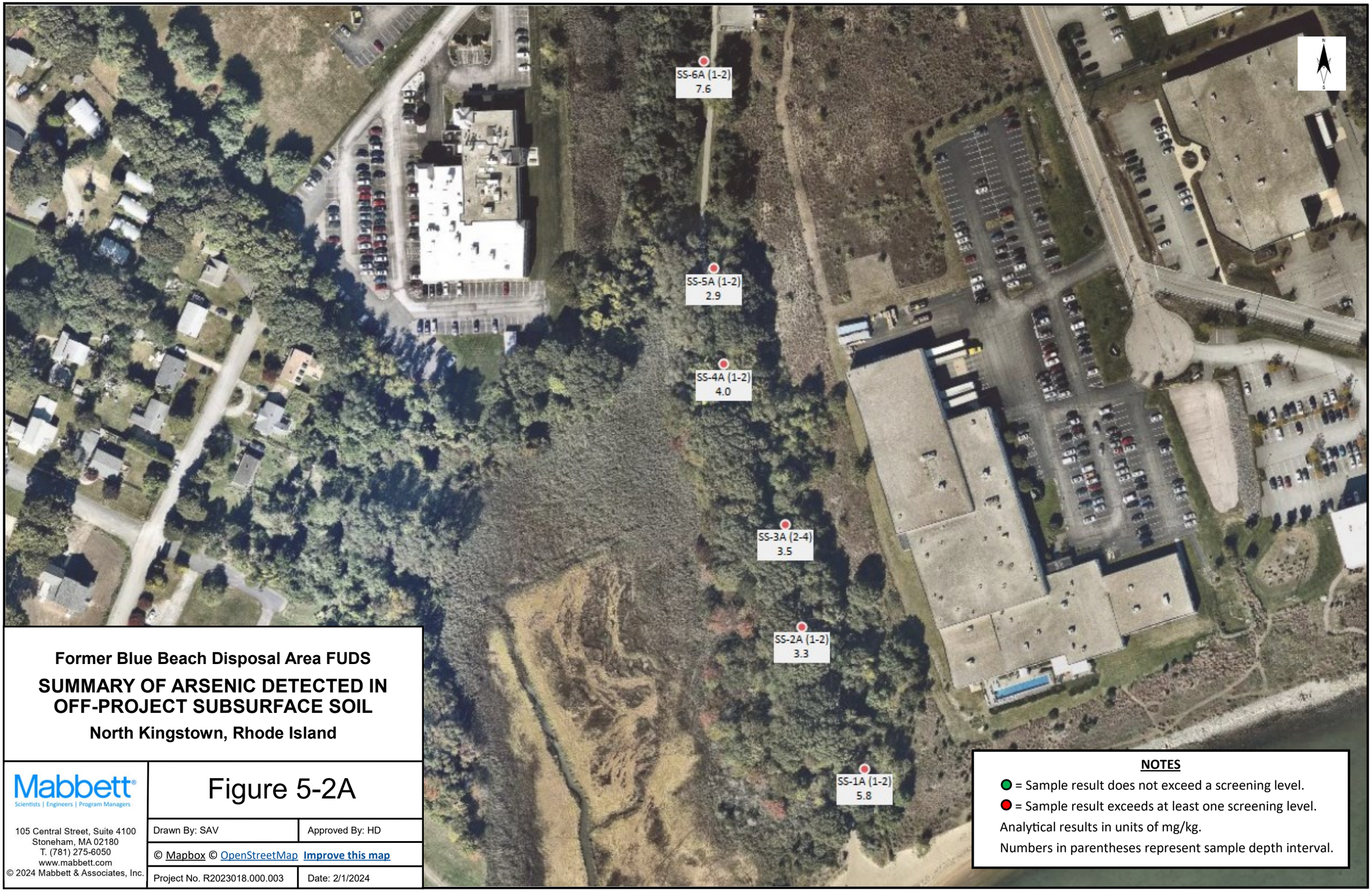

Former Blue Beach Disposal Area FUDS

SUMMARY OF ARSENIC DETECTED IN OFF-PROJECT SUBSURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Numbers in parentheses represent sample depth interval.

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Figure 5-2A

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Project No. R2023018.000.003	Date: 2/1/2024

SSH-301
14.6

SSH-302
5.0

SSH-6A
6.5 J

SSH-303
13.9

SSH-5A
10.5

SSH-4A
7.6 J

SSH-305
10.2

SSH-304
15.7

SSH-306
5.3

SSH-3A
4.3 J

SSH-307
9.7

SSH-308
8.7

SSH-309
16.3

SSH-2A
4.4 J

SSH-310
2.4

SSH-1A
5.9

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

Former Blue Beach Disposal Area FUDS

SUMMARY OF ARSENIC DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

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Figure 5-2B

Drawn By: SAV	Approved By: HD
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Project No. R2023018.000.003	Date: 2/1/2024

MW-4 (2019)
3.6 J

MW-8 (2019)
5.8

MW-10 (2019)
3.5 J

W94-6 (2019)
3.9 J

BB-4 (2019)
8.9

MW-12 (2019)
5.4

MW-11 (2019)
4.0 U

MW-108D (2014)
1.0 U

MW-108S (2014)
1.0 U

MW-108D (2019)
4.0 U

MW-108S (2019)
4.0 U

BB-3 (2019)
12.0

TS-UP-2 (2014)
0.7 J

TS-UP-1 (2014)
6.4 J

WP-5 (2019)
2.4 J

MW-107 (2014)
1.0 U

MW-107 (2019)
3.3 J

TS-3-A (2014)
10.8 J

OW-9 (2014)
5.0

CDW-4 (2019)
4.0 U

OW-9 (2019)
3.0 J

TS-3-B (2014)
5.9 J

MW-105 (2014)
3.1

COE-6 (2019)
4.0 U

TS-3-C (2014)
1.7 J

TS-3-D (2014)
3.0 U

COE-2 (2019)
4.0 U

WP-6 (2019)
4.0 U

MW-104 (2014)
1.0 U

MW-106D (2019)
4.0 U

OW-3 (2014)
1.0 U

OW-3 (2019)
4.0 U

MW-104 (2019)
4.0 U

CDW-3 (2019)
6.2

MW-106S (2019)
8.5

BMW-3 (2014)
1.0 U

BMW-3 (2019)
4.0 U

MW-103 (2014)
1.0 U

COE-3 (2019)
4.9 J

CDW-2 (2019)
4.0 U

MW-102 (2014)
1.0 U

MW-103 (2019)
4.0 U

PZ-2 (2019)
4.8 J

PZ-1 (2019)
4.0 U

MW-101S (2014)
1.0 U

MW-101D (2014)
1.0 U

MW-102 (2019)
4.0 U

MW-101D (2019)
4.0 U

MW-101S (2019)
4.0 U

CDW-1 (2019)
4.0 U

W98-1 (2019)
4.0 U

COE-1 (2019)
5.4

COE-5 (2019)
4.0 U

Former Blue Beach Disposal Area FUDS

SUMMARY OF ARSENIC DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Sample date provided in parentheses.

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Figure 5-2C

Drawn By: SAV	Approved By: HD
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MW-4 (2019) 31.0
MW-8 (2019) 14.5
MW-10 (2019) 13.1
W94-6 (2019) 89.3
BB-4 (2019) 77.8
MW-12 (2019) 28.7
MW-11 (2019) 18.8
MW-21 (2019) 4.3
MW-108S (2014) 80.3
MW-108D (2014) 4.8 J
COE-7 (2019) 10.8
TS-UP-2 (2014) 25.4 J
BB-3 (2019) 53.4
MW-107 (2014) 104.0
MW-108S (2019) 99.1
MW-108D (2019) 4.9
WP-5 (2019) 8.2
TS-UP-1 (2014) 27.3 J
TS-UP-1 (2014) 922.0 J
MW-107 (2019) 95.9
CDW-4 (2019) 27.7
OW-9 (2019) 14.5
TS-3-A (2014) 587.0
TS-3-B (2014) 237.0
MW-105 (2014) 46.3
COE-6 (2019) 10.7
TS-3-C (2014) 39.9
TS-3-D (2014) 43.5 J
COE-2 (2019) 23.3
WP-6 (2019) 18.1
OW-3 (2014) 24.8 J
BMW-3 (2014) 8.5 J
MW-106S (2019) 50.1
CDW-3 (2019) 128.0
OW-3 (2019) 6.5
BMW-3 (2019) 12.0
MW-104 (2014) 5.5 J
MW-104 (2019) 15.3
MW-106D (2019) 38.7
CDW-2 (2019) 10.9
MW-102 (2014) 12.2 J
MW-103 (2014) 2.9 J
COE-3 (2019) 20.1 J
MW-102 (2019) 12.9
MW-103 (2019) 8.8
PZ-1 (2019) 60.6
MW-101S (2014) 3.0 U
MW-101D (2014) 3.0 U
W98-1 (2019) 48.6
PZ-2 (2019) 57.0
CDW-1 (2019) 16.9
MW-101S (2019) 2.0 U
MW-101D (2019) 1.6 J
COE-1 (2019) 14.0
COE-5 (2019) 11.0

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Sample date provided in parentheses.

Former Blue Beach Disposal Area FUDS

SUMMARY OF BARIUM DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

Figure 5-3A

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Former Blue Beach Disposal Area FUDS

SUMMARY OF BARIUM (DISSOLVED) DETECTED IN SURFACE WATER

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Sample date provided in parentheses.

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Figure 5-3B

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Former Blue Beach Disposal Area FUDS

SUMMARY OF BARIUM (TOTAL) DETECTED IN SURFACE WATER

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Sample date provided in parentheses.

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Figure 5-3C

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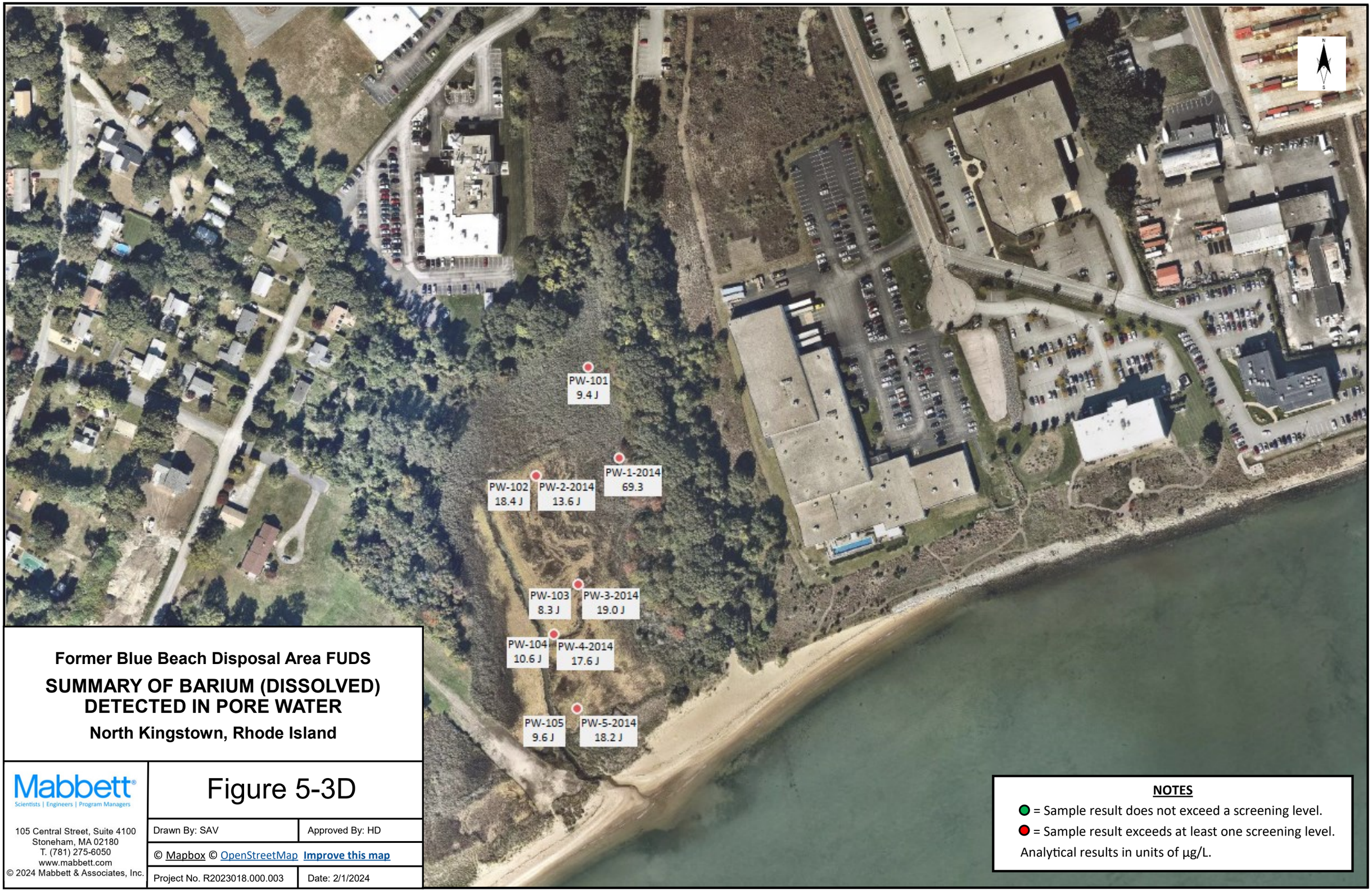

Former Blue Beach Disposal Area FUDS

SUMMARY OF BARIUM (DISSOLVED) DETECTED IN PORE WATER

North Kingstown, Rhode Island

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Figure 5-3D

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Former Blue Beach Disposal Area FUDS

SUMMARY OF BARIUM (TOTAL) DETECTED IN PORE WATER

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-3E

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Former Blue Beach Disposal Area FUDS

SUMMARY OF CADMIUM DETECTED IN ON-PROJECT SURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-4A

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Former Blue Beach Disposal Area FUDS

SUMMARY OF CADMIUM DETECTED IN ON-PROJECT SUBSURFACE SOIL

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

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Figure 5-4B

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Former Blue Beach Disposal Area FUDS

SUMMARY OF CADMIUM DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-4C

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Project No. R2023018.000.003	Date: 2/1/2024

MW-4 (2019)
0.05 J

MW-8 (2019)
0.04 J

MW-10 (2019)
0.20 U

MW-12 (2019)
0.18 J

W94-6 (2019)
0.10 J

MW-11 (2019)
1.00 U

COE-7 (2019)
0.63 J

TS-UP-2 (2014)
0.18

BB-3 (2019)
0.27 J

MW-108D (2014)
0.12 J

MW-107 (2014)
2.80

MW-108D (2019)
0.16 J

MW-108S (2019)
31.20

MW-107 (2019)
1.16

TS-UP-1 (2014)
4.27

TS-3-A (2014)
4.81

OW-9 (2014)
1.94

OW-9 (2019)
1.00 U

TS-3-B (2014)
1.91

MW-105 (2014)
0.10 U

COE-6 (2019)
0.20 U

TS-3-C (2014)
0.12 J

TS-3-D (2014)
0.62 U

COE-2 (2019)
1.20

WP-6 (2019)
1.00 U

OW-3 (2014)
0.26

BMW-3 (2014)
0.10 J

MW-104 (2019)
0.20 U

MW-106D (2019)
0.20 U

CDW-3 (2019)
0.31 J

OW-3 (2019)
0.23 J

BMW-3 (2019)
0.04 J

MW-104 (2014)
0.10 U

MW-106S (2019)
1.00 U

MW-103 (2014)
0.10 J

CDW-2 (2019)
0.05 J

MW-102 (2014)
0.10 U

MW-103 (2019)
0.13 J

PZ-1 (2019)
1.00 U

MW-101D (2014)
0.10 U

MW-101S (2014)
0.10 U

MW-102 (2019)
0.04 J

PZ-2 (2019)
0.20 U

W98-1 (2019)
1.00 U

CDW-1 (2019)
0.07 J

MW-101D (2019)
1.00 U

MW-101S (2019)
0.06 J

COE-5 (2019)
1.00 U

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF CADMIUM DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

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Figure 5-4D

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MW-4
5.0 U
2019

MW-8
5.0 U
2019

MW-10
5.0 U
2019

MW-11
5.0 U
2019

MW-12
5.0 U
2019

W94-6
5.0 U
2019

TS-UP-2
39.7
2014

TS-UP-1
637.0
2014

WP-5
5.0 U
2019

TS-3-A
63.5
2014

OW-9
5.0 U
2019

COE-6
5.0 U
2019

OW-3
3.0 U
2014

OW-3
5.0 U
2019

COE-2
5.0 U
2019

MW-106S
5.0 U
2019

WP-6
5.0 U
2019

CDW-3
17.0
2019

MW-106D
5.0 U
2019

CDW-2
5.0 U
2019

BMW-3
3.0 U
2014

BMW-3
5.0 U
2019

PZ-1
5.0 U
2019

W98-1
5.0 U
2019

PZ-2
5.0 U
2019

COE-1
72.3
2019

COE-5
16.0
2019

CDW-1
5.0 U
2019

MW-101S
3.0 U
2014

MW-101D
3.0 U
2014

MW-101S
5.0 U
2019

MW-101D
5.0 U
2019

MW-102
3.0 U
2014

MW-102
5.0 U
2019

MW-103
3.0 U
2014

MW-103
5.0 U
2019

MW-104
3.0 U
2014

MW-104
5.0 U
2019

MW-105
3.0 U
2014

MW-107
3.0 U
2014

MW-107
5.0 U
2019

MW-108D
3.0 U
2014

MW-108D
5.0 U
2019

MW-108S
2.1 J
2014

MW-108S
9.7
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF CHROMIUM DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

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Figure 5-5

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MW-4
0.37 J
2019

MW-8
1.08
2019

MW-10
0.54 J
2019

W94-6
0.36 J
2019

COE-7
3.11
2019

MW-11
6.95
2019

BB-3
1.92
2019

MW-108S
1.00 U
2019

MW-108D
0.94 J
2019

MW-107
1.04
2019

WP-5
1.42
2019

CDW-4 (2019)
0.09

OW-9
6.56
2019

OW-3
3.48
2019

COE-2
1.18
2019

MW-106S
1.00 U
2019

WP-6
6.84
2019

CDW-3
10.60
2019

BMW-3
0.11 J
2019

MW-106D
6.70
2019

CDW-2
0.64 J
2019

MW-104
0.12 J
2019

MW-103
0.14 J
2019

PZ-1
1.00 U
2019

PZ-2
1.00 U
2019

MW-101D
0.14 J
2019

MW-102
0.88 J
2019

COE-1
29.60
2019

W98-1
5.09
2019

CDW-1
1.03
2019

MW-101S
0.07 J
2019

COE-5
17.30
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF COBALT DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

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Figure 5-6

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Former Blue Beach Disposal Area FUDS

SUMMARY OF COPPER DETECTED IN ON-PROJECT SURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-7A

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Former Blue Beach Disposal Area FUDS

SUMMARY OF COPPER DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-7B

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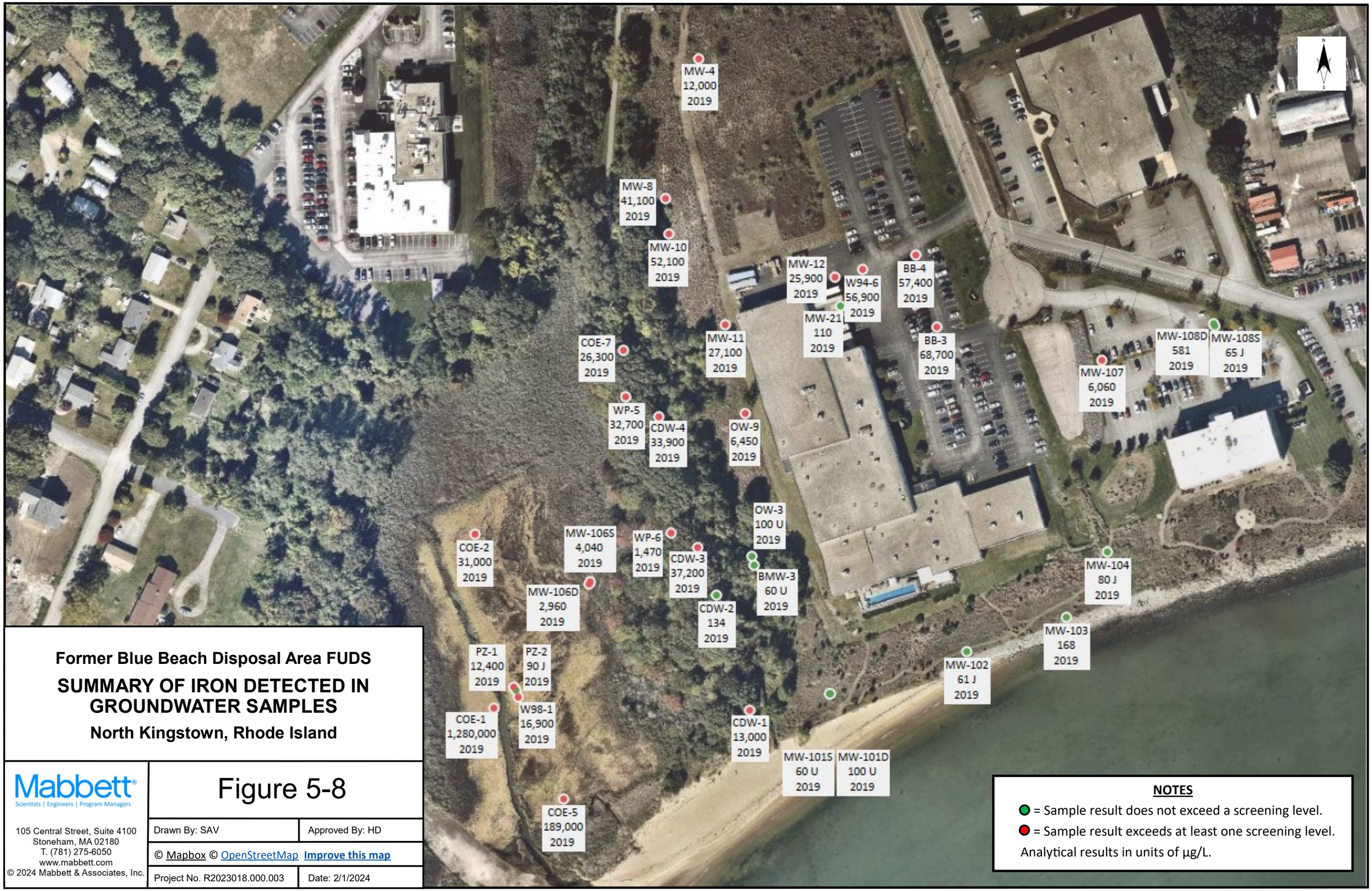

Former Blue Beach Disposal Area FUDS

SUMMARY OF IRON DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-8

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Former Blue Beach Disposal Area FUDS

SUMMARY OF LEAD DETECTED IN ON-PROJECT SURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-9A

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Former Blue Beach Disposal Area FUDS

SUMMARY OF LEAD DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-9B

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MW-4
4.1
2019

MW-8
1.0 U
2019

MW-10
1.0 U
2019

MW-11
0.4 J
2019

MW-12
1.1
2019

W94-6
1.0 U
2019

BB-3
0.6 J
2019

MW-108S
1.0 UJ
2014

MW-108D
1.0 UJ
2014

MW-108S
1.0 U
2019

MW-108D
1.0 U
2019

MW-107
1.0 UJ
2014

MW-107
0.5 U
2019

COE-7
0.6 J
2019

TS-UP-2
1.0 UJ
2014

TS-UP-1
305.0
2014

TS-3-A
229.0
2014

OW-9
1.0 UJ
2014

TS-3-B
76.5
2014

MW-105
1.0 UJ
2014

COE-6
3.7
2019

OW-3
1.0 UJ
2014

OW-3
0.1 J
2019

COE-2
11.2
2019

MW-106D
0.5 U
2019

WP-6
1.0 U
2019

CDW-3
20.3
2019

MW-104
1.0 UJ
2014

MW-104
1.0 U
2019

BMW-3
1.0 UJ
2014

BMW-3
0.5 U
2019

MW-106S
0.4 J
2019

CDW-2
1.0 U
2019

MW-103
1.0 UJ
2014

MW-103
1.0 U
2019

PZ-1
0.2 J
2019

PZ-2
0.5 U
2019

MW-101D
1.0 UJ
2014

MW-101S
1.0 UJ
2014

MW-102
1.0 UJ
2014

MW-102
1.0 U
2019

W98-1
0.5 U
2019

MW-101D
0.2 J
2019

MW-101S
0.5 U
2019

COE-1
451.0
2019

CDW-1
3.8
2019

COE-5
4.0
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF LEAD DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

Figure 5-9C

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Former Blue Beach Disposal Area FUDS

SUMMARY OF LEAD (DISSOLVED) DETECTED IN PORE WATER

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-9D

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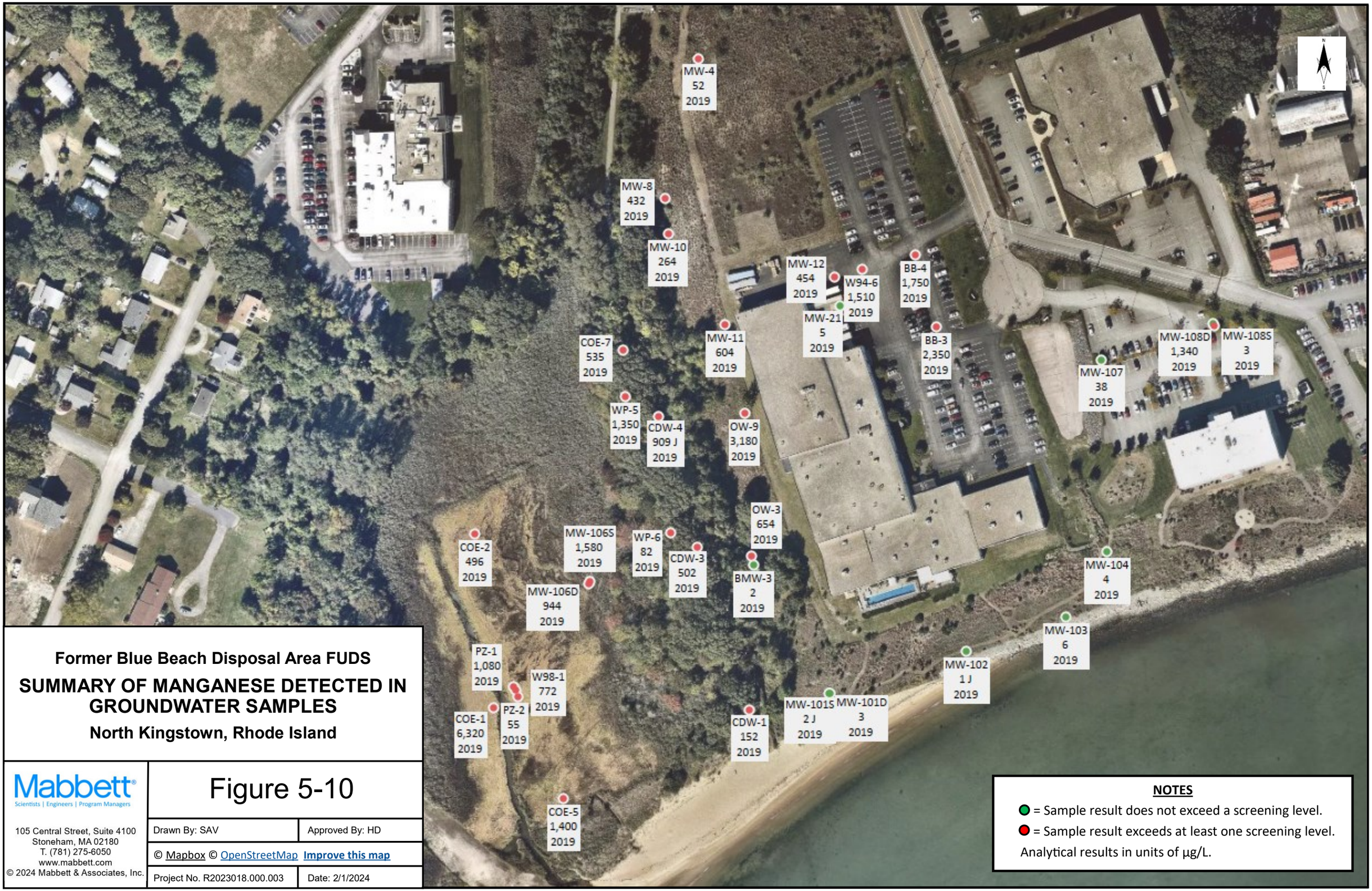

Former Blue Beach Disposal Area FUDS

SUMMARY OF MANGANESE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-10

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SUMMARY OF MERCURY DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-11

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SUMMARY OF SELENIUM DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-12

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Former Blue Beach Disposal Area FUDS

SUMMARY OF SILVER (TOTAL) DETECTED IN PORE WATER

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-13

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SUMMARY OF THALLIUM DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-14A

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Former Blue Beach Disposal Area FUDS

SUMMARY OF THALLIUM DETECTED IN OFF-PROJECT SUBSURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Numbers in parentheses represent sample depth interval.

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Figure 5-14B

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Former Blue Beach Disposal Area FUDS

SUMMARY OF ZINC DETECTED IN ON-PROJECT SURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of mg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-15

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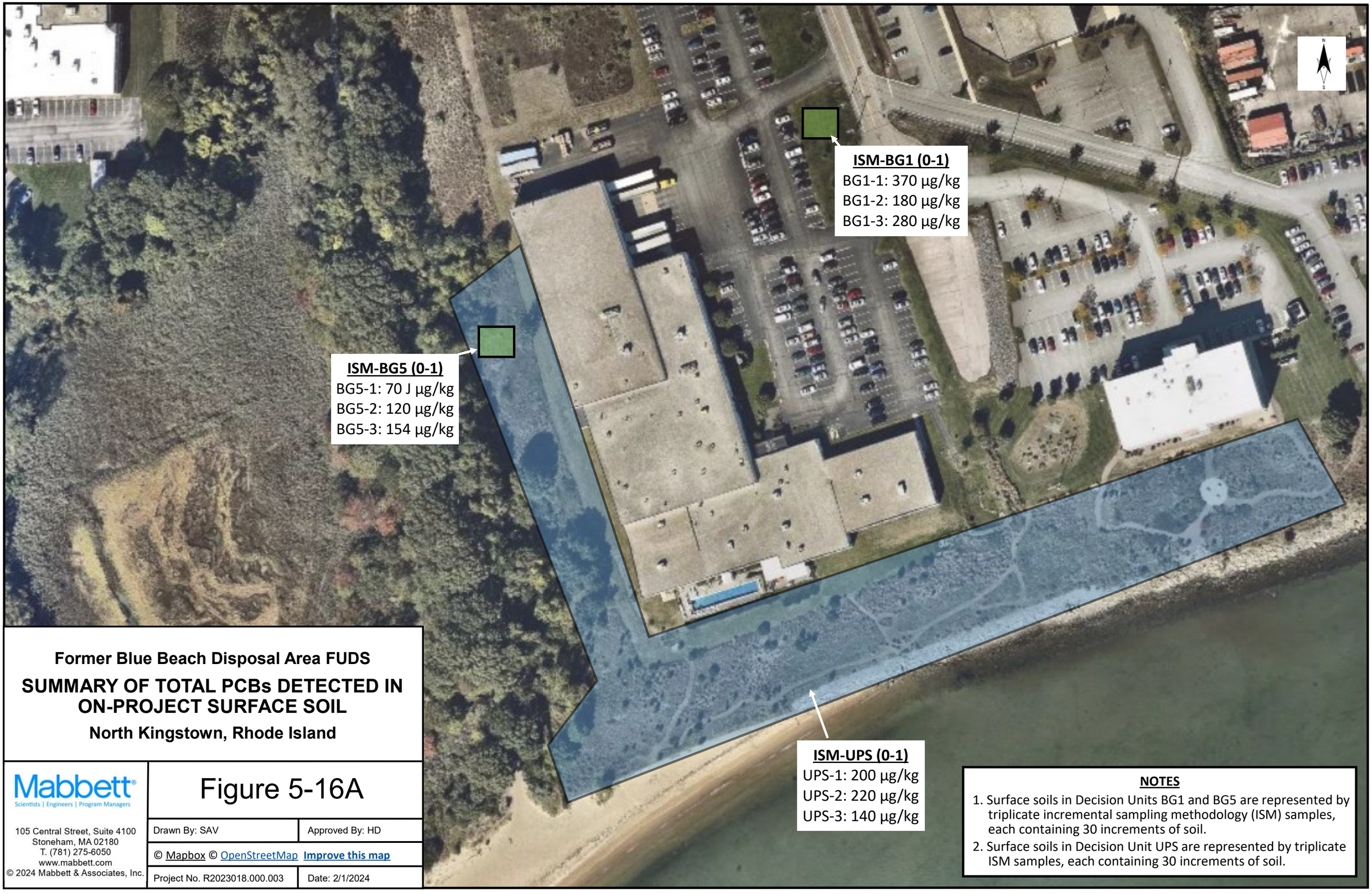

Former Blue Beach Disposal Area FUDS

SUMMARY OF TOTAL PCBs DETECTED IN ON-PROJECT SURFACE SOIL

North Kingstown, Rhode Island

NOTES

1. Surface soils in Decision Units BG1 and BG5 are represented by triplicate incremental sampling methodology (ISM) samples, each containing 30 increments of soil.
2. Surface soils in Decision Unit UPS are represented by triplicate ISM samples, each containing 30 increments of soil.

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Figure 5-16A

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ISM-BG1 (1-3)
BG1-1: 330 µg/kg
BG1-2: 370 µg/kg
BG1-3: 220 µg/kg

ISM-BG5 (1-3)
BG5-1: 29 J µg/kg
BG5-2: 24 J µg/kg
BG5-3: 12 J µg/kg

ISM-UPS (1-3)
UPS-1: 48 J µg/kg
UPS-2: 66 J µg/kg
UPS-3: 22 J µg/kg

NOTES

1. Subsurface soils in Decision Units BG1 and BG5 are represented by triplicate incremental sampling methodology (ISM) samples, each containing 10 increments of soil collected from three different soil borings advanced within the Decision Unit.
2. Subsurface soils in Decision Unit UPS are represented by triplicate ISM samples, each containing 3 increments of soil collected from ten different soil borings advanced within the Decision Unit.

Former Blue Beach Disposal Area FUDS

SUMMARY OF TOTAL PCBs DETECTED IN ON-PROJECT SUBSURFACE SOIL

North Kingstown, Rhode Island

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Figure 5-16B

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Former Blue Beach Disposal Area FUDS

SUMMARY OF TOTAL PCBs DETECTED IN OFF-PROJECT SURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-16C

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Former Blue Beach Disposal Area FUDS

SUMMARY OF TOTAL PCBs DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-16D

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SSH-301 (1-2)
67 U

SSH-302 (1-2)
58 UJ

SSH-302 (1-2)
54 U

SSH-6A (1-2)
98 J

SSH-303 (1-2)
53 U

SSH-5A (1-2)
215 U

SSH-4A (1-2)
298 U

SSH-305 (1-2)
40 UJ

SSH-304 (1-2)
31 U

SSH-306 (1-2)
34 U

SSH-3A (1-2)
245 U

SSH-307 (1-2)
32 U

SSH-308 (1-2)
26 UJ

SSH-309 (1-2)
11 UJ

SSH-2A (1-2)
200 U

SSH-310 (1-2)
22 U

SSH-1A (1-2)
145 U

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Numbers in parentheses represent sample depth interval.

Former Blue Beach Disposal Area FUDS

SUMMARY OF TOTAL PCBs DETECTED IN OFF-PROJECT SUBSURFACE HYDRIC SOIL

North Kingstown, Rhode Island

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Figure 5-16E

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SED-321
5 U
SED-322
5 U
SED-322
28 J
SED-101
119 J
SED-323
27 U
SED-324
5 U
SED-326
10 U
SED-325
9 U
SED-327
9 U
SED-5A
17 J
SED-328
54 U
SED-329
12 U
SED-330
22 J
SED-331
68 UJ
SED-4A
104
SED-332
72 U
SED-333
22 U
SED-334
170 J
SED-3A
83 U
SED-335
1,300
SED-336
340 J
SED-337
170 J
SED-338
140 J
SED-1A
70 U
SED-339
28 J
SED-340
56 J
SED-301
17 J
SED-302
17 J
SED-303
24 J
SED-304
20 J
SED-305
19 J
SED-306
19 J
SED-307
16 J
SED-308
17 J
SED-309
22 J
SED-310
25 J

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Former Blue Beach Disposal Area FUDS

SUMMARY OF TOTAL PCBs DETECTED IN OFF-PROJECT SEDIMENT

North Kingstown, Rhode Island

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Figure 5-16F

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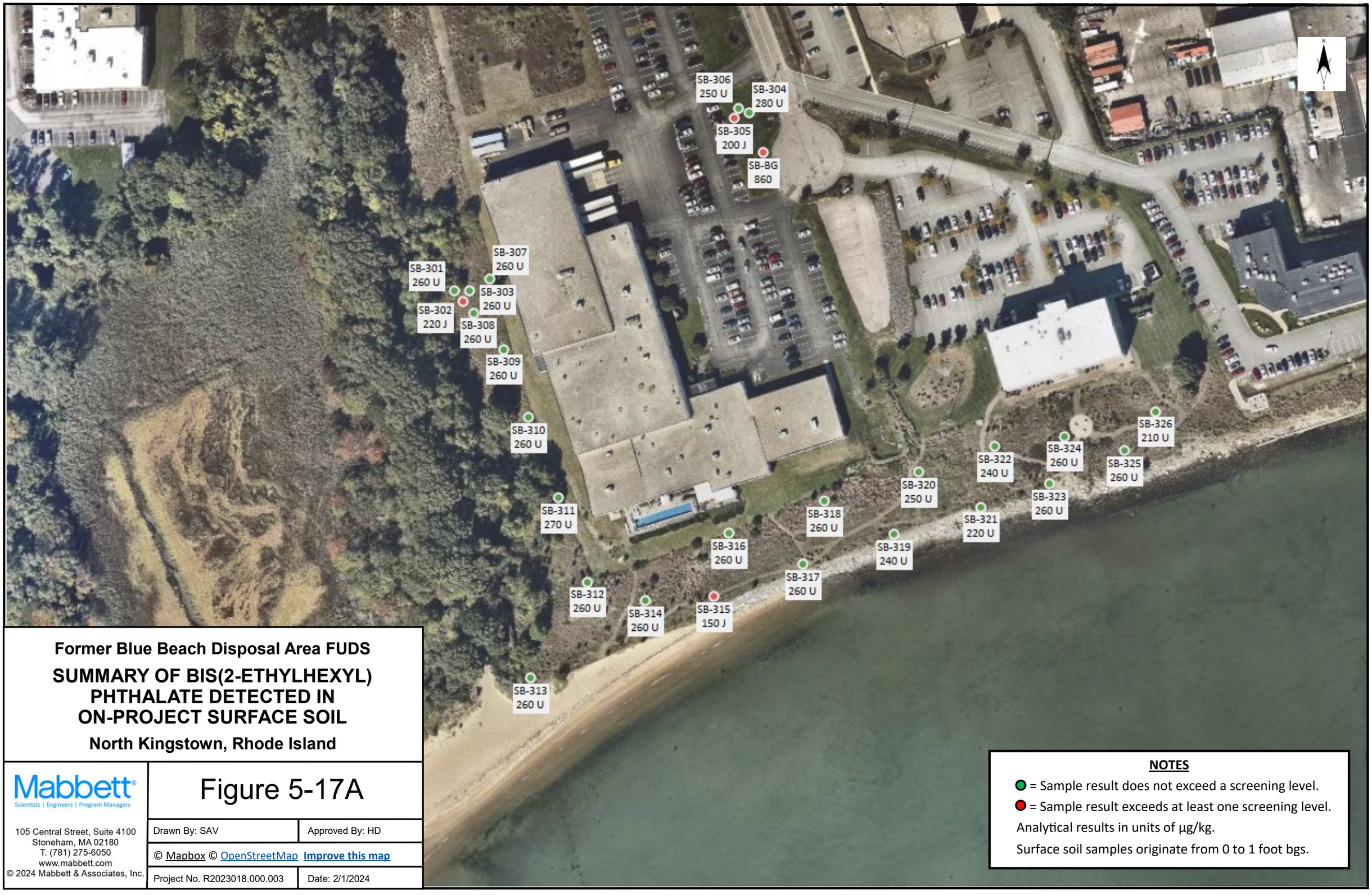

Former Blue Beach Disposal Area FUDS

SUMMARY OF BIS(2-ETHYLHEXYL) PHTHALATE DETECTED IN ON-PROJECT SURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-17A

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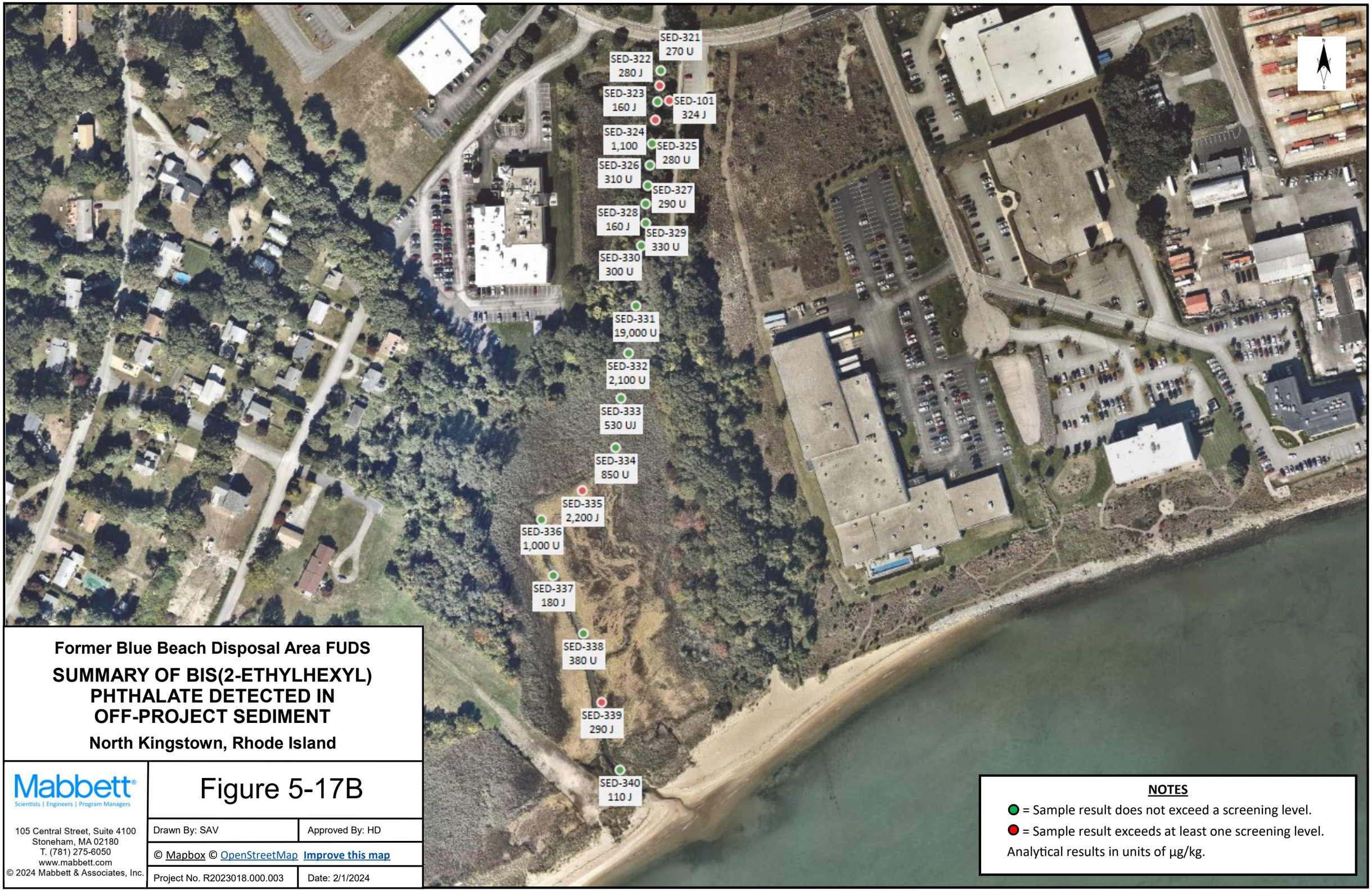

Former Blue Beach Disposal Area FUDS

SUMMARY OF BIS(2-ETHYLHEXYL) PHTHALATE DETECTED IN OFF-PROJECT SEDIMENT

North Kingstown, Rhode Island

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Figure 5-17B

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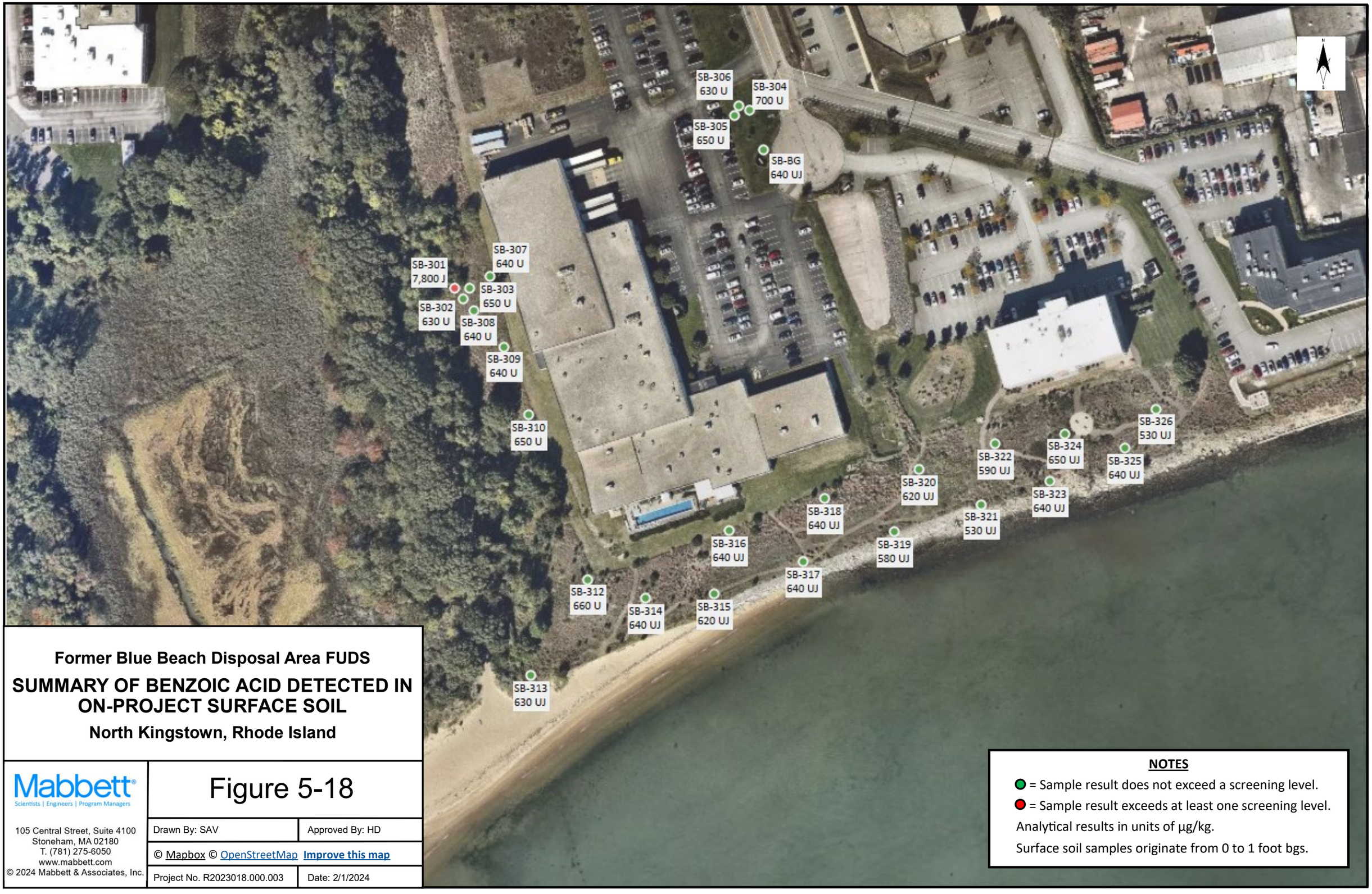
NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.



Former Blue Beach Disposal Area FUDS

SUMMARY OF BENZOIC ACID DETECTED IN ON-PROJECT SURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-18

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SUMMARY OF BENZO(A)PYRENE DETECTED IN ON-PROJECT SURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-19A

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SUMMARY OF BENZO(A)PYRENE DETECTED IN OFF-PROJECT SUBSURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Numbers in parentheses represent sample depth interval.

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Figure 5-19B

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SUMMARY OF BENZO(A)PYRENE DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-19C

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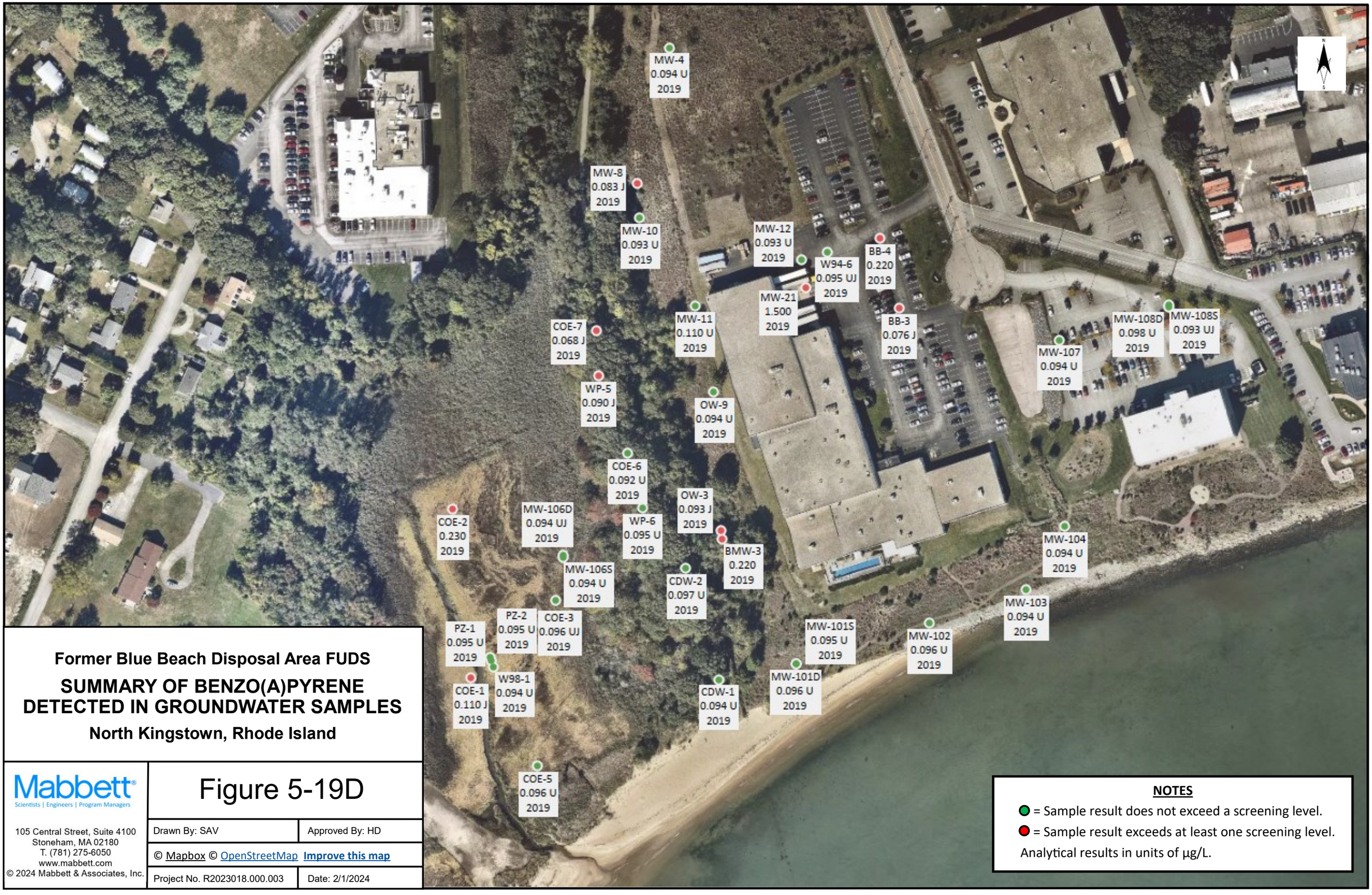

Former Blue Beach Disposal Area FUDS

SUMMARY OF BENZO(A)PYRENE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-19D

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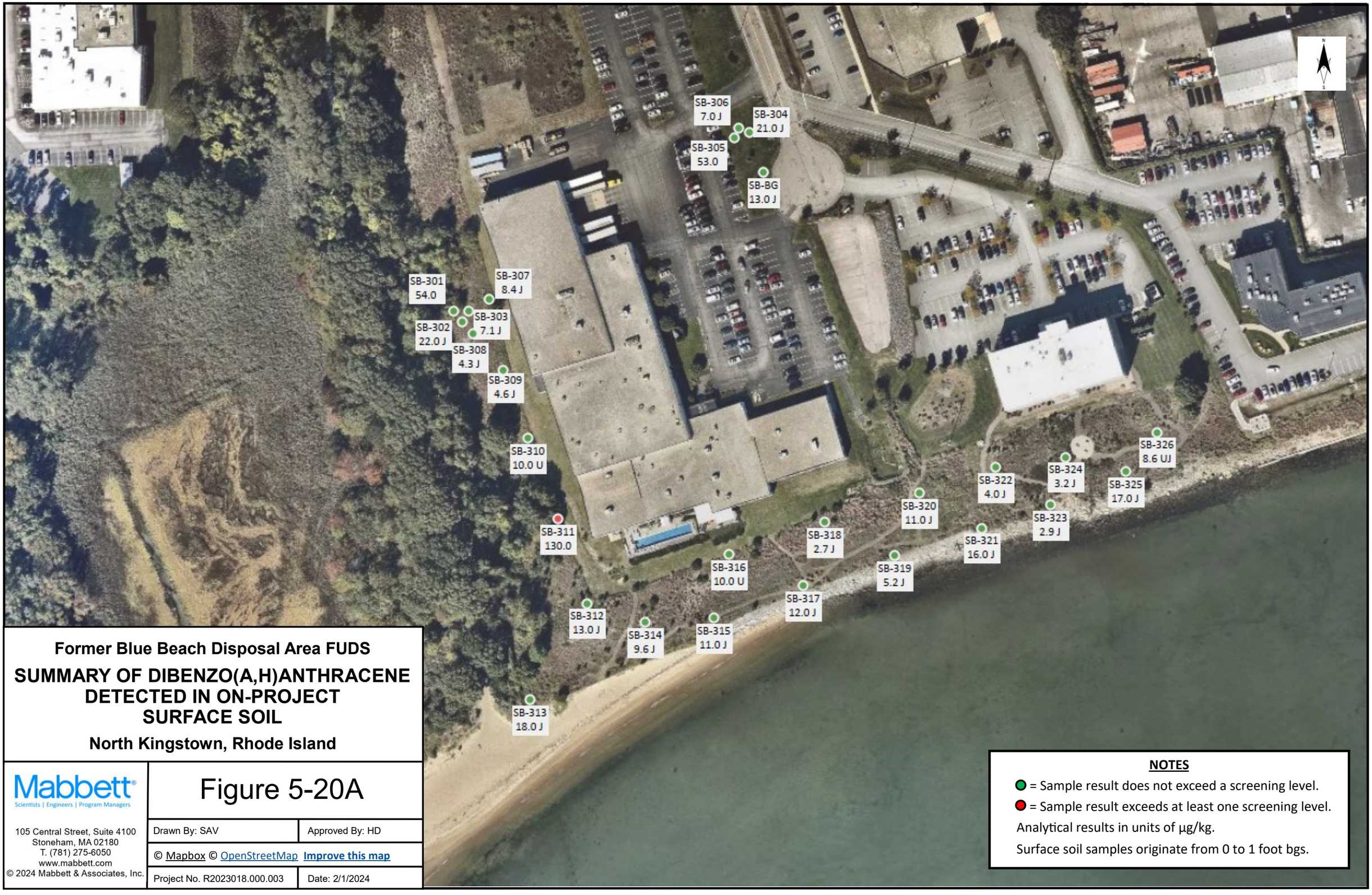

Former Blue Beach Disposal Area FUDS

SUMMARY OF DIBENZO(A,H)ANTHRACENE DETECTED IN ON-PROJECT SURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-20A

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SUMMARY OF DIBENZO(A,H)ANTHRACENE DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-20B

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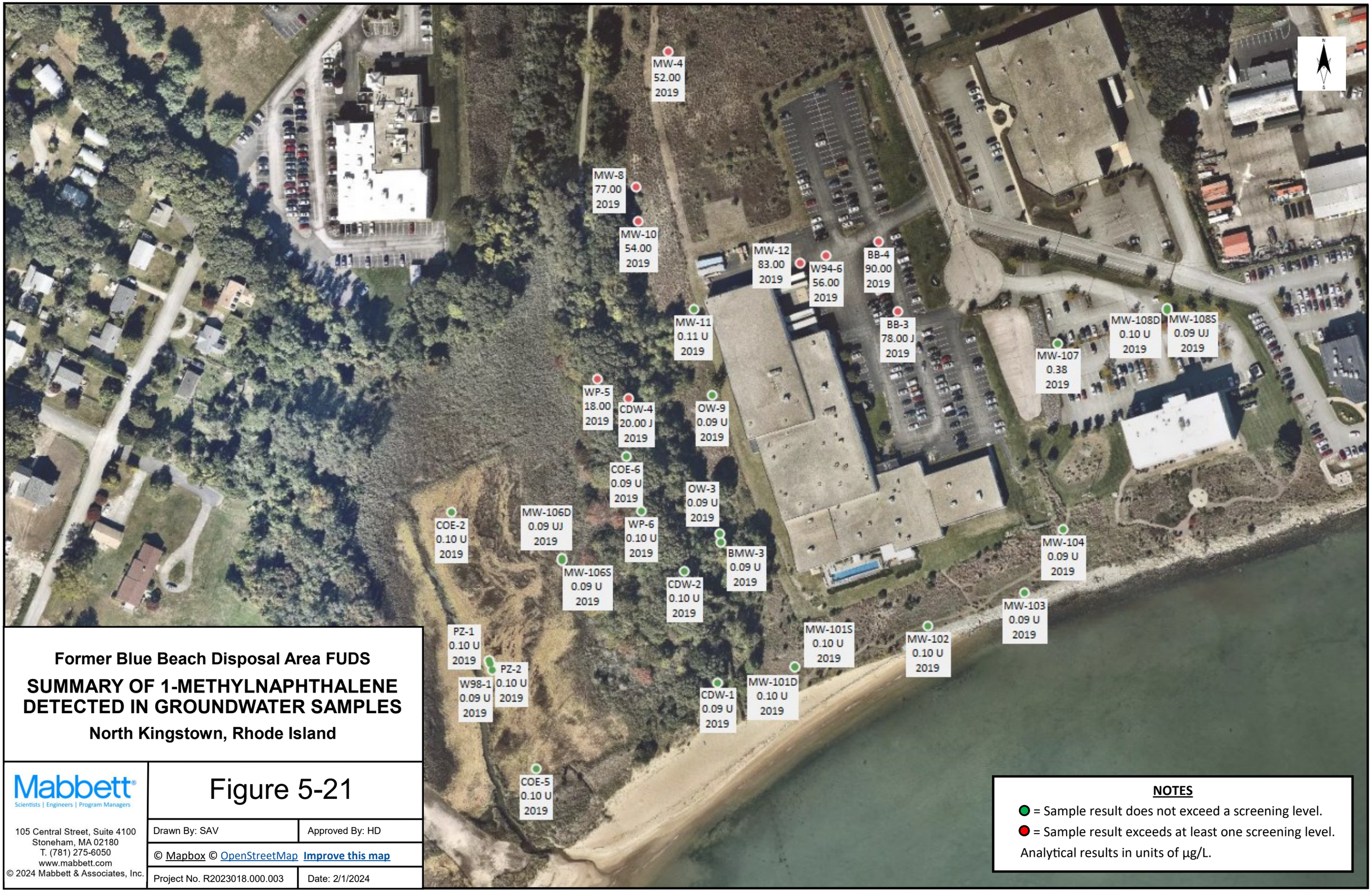

Former Blue Beach Disposal Area FUDS

SUMMARY OF 1-METHYLNAPHTHALENE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-21

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MW-4
30.00
2019

MW-8
130.00 J
2019

MW-10
86.00
2019

MW-12
110.00
2019

W94-6
66.00
2019

BB-4
85.00
2019

BB-3
35.00 J
2019

MW-11
0.11 U
2019

MW-107
0.09 U
2019

MW-108D
0.10 U
2019

MW-108S
0.09 UJ
2019

WP-5
14.00
2019

CDW-4
21.00 J
2019

OW-9
0.09 U
2019

COE-6
0.09 U
2019

OW-3
0.09 U
2019

COE-2
0.10 U
2019

MW-106D
0.09 UJ
2019

WP-6
0.10 U
2019

BMW-3
0.09 U
2019

MW-104
0.09 U
2019

MW-106S
0.09 U
2019

CDW-2
0.10 U
2019

MW-103
0.09 U
2019

PZ-1
0.10 U
2019

PZ-2
0.10 U
2019

W98-1
0.09 U
2019

MW-101S
0.10 U
2019

MW-102
0.10 U
2019

CDW-1
0.09 U
2019

MW-101D
0.10 U
2019

COE-5
0.10 U
2019

Former Blue Beach Disposal Area FUDS

SUMMARY OF 2-METHYLNAPHTHALENE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-22

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MW-4
0.250 J
2019

MW-8
0.093 J
2019

MW-10
0.093 U
2019

MW-12
0.093 U
2019

W94-6
0.095 UJ
2019

BB-4
0.096 J
2019

MW-21
0.570
2019

BB-3
0.052 J
2019

COE-7
0.062 J
2019

MW-11
0.110 U
2019

MW-107
0.094 UJ
2019

MW-108D
0.098 UJ
2019

MW-108S
0.093 UJ
2019

WP-5
0.058 J
2019

OW-9
0.094 U
2019

COE-6
0.092 U
2019

COE-2
0.460
2019

MW-106D
0.094 UJ
2019

WP-6
0.095 U
2019

OW-3
0.052 J
2019

BMW-3
0.240
2019

MW-104
0.094 UJ
2019

MW-106S
0.094 U
2019

CDW-2
0.097 UJ
2019

MW-103
0.094 UJ
2019

PZ-1
0.095 U
2019

PZ-2
0.095 U
2019

MW-101S
0.095 U
2019

MW-102
0.096 UJ
2019

COE-1
0.400
2019

W98-1
0.094 U
2019

CDW-1
0.094 UJ
2019

MW-101D
0.260
2019

COE-5
0.096 U
2019

Former Blue Beach Disposal Area FUDS

SUMMARY OF BENZO(A)ANTHRACENE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-23

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Project No. R2023018.000.003	Date: 2/1/2024

Former Blue Beach Disposal Area FUDS

SUMMARY OF BENZO(B)FLUORANTHENE DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-24A

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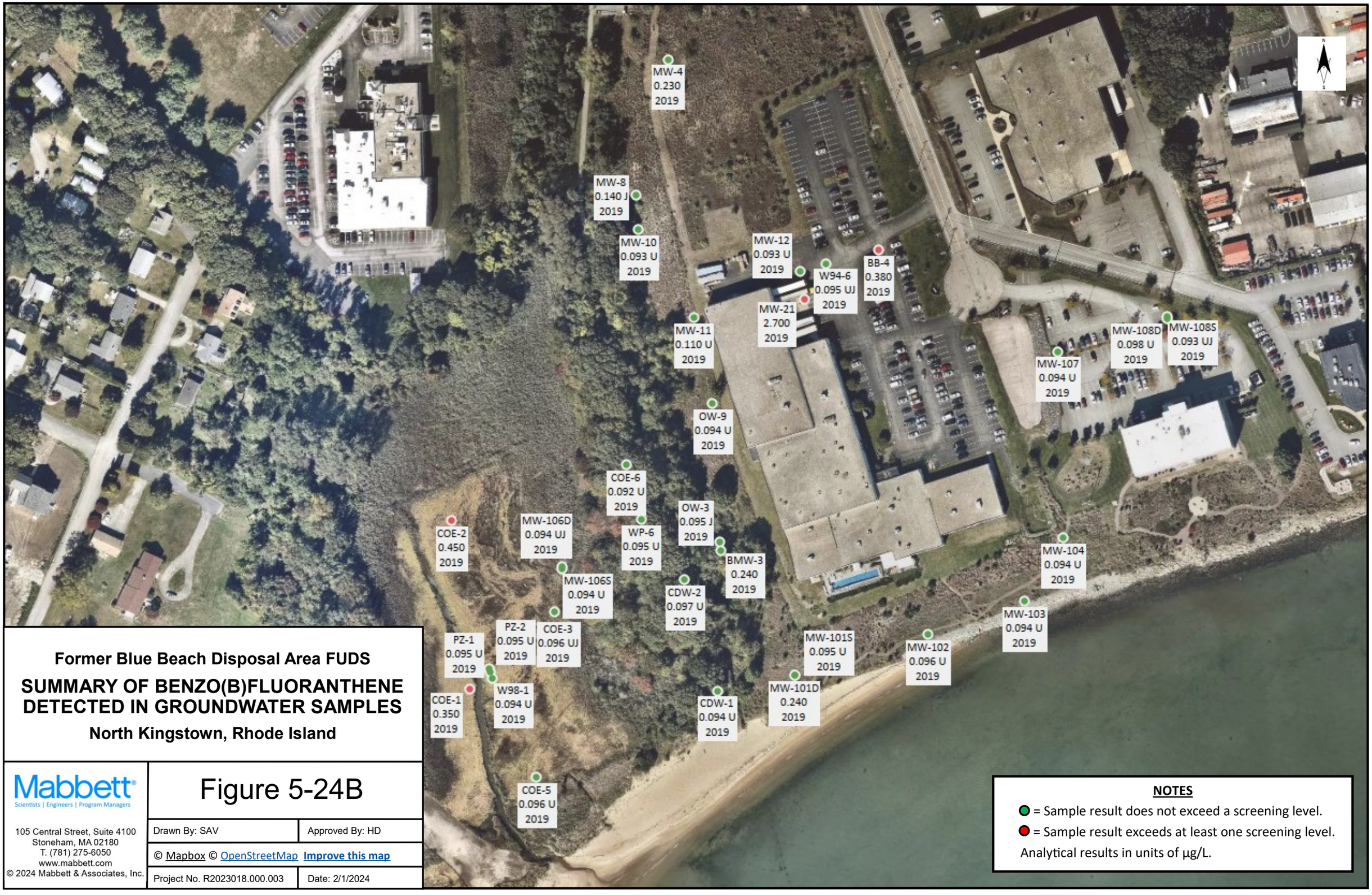

Former Blue Beach Disposal Area FUDS

SUMMARY OF BENZO(B)FLUORANTHENE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-24B

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Project No. R2023018.000.003	Date: 2/1/2024

Former Blue Beach Disposal Area FUDS

SUMMARY OF INDENO(1,2,3-CD)PYRENE DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-25

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EA20VP
0.2 U

EA27VP
0.0 U

GP-TR3B 6-6.5
715.0

SB-307
21.0

GP-TR2 6-8
2,580.0

GP2-TR2A 6-7
3.4 J

GP-TR1 5-7
2,140.0

GP2-TR1B 6-6.5
1.8 J

SB-308
9.1 J

GP2-TR2D 6-7
5.8

SB-309
7.2

SB-310
2.4 UJ

SB-311
2.1 U

SB-312
2.4 U

SB-314
2.4 U

SB-315
2.3 U

SB-316
2.5 U

SB-102
4.0 U

SB-317
2.3 U

SB-318
2.5 U

SB-103
3.4 U

SB-319
2.5 U

SB-104
2.7 U

SB-320
2.3 U

SB-321
2.2 U

SB-322
2.5 U

SB-323
2.2 U

SB-324
1.2 U

SB-325
3.2 U

SB-326
2.8 U

SB-105
3.7 U

SB-107
5.3 U

SB-101
2.2 U

SB-313
2.5 U

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Numbers in parentheses represent sample depth interval.

Former Blue Beach Disposal Area FUDS

SUMMARY OF TRICHLOROETHENE DETECTED IN ON-PROJECT SUBSURFACE SOIL

North Kingstown, Rhode Island

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Figure 5-26A

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Former Blue Beach Disposal Area FUDS

SUMMARY OF TRICHLOROETHENE DETECTED IN GROUNDWATER SAMPLES 2014

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-26B

Drawn By: SAV	Approved By: HD
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Project No. R2023018.000.003	Date: 2/1/2024

MW-4
0.5 U
2019

MW-8
0.5 U
2019

MW-10
0.5 U
2019

MW-12
0.5 U
2019

W94-6
0.5 U
2019

MW-11
0.5 U
2019

MW-21
0.5 U
2019

MW-108D
0.5 U
2019

MW-108S
1.4
2019

MW-107
0.5 U
2019

WP-5
0.5 U
2019

OW-9
3.3
2019

COE-6
0.9 J
2019

OW-3
46.0
2019

COE-2
0.5 U
2019

MW-106D
4.9
2019

WP-6
0.5 UJ
2019

CDW-3
1.7
2019

BMW-3
28.0
2019

MW-104
0.5 U
2019

MW-103
0.5 U
2019

MW-106S
14.0
2019

CDW-2
1.6
2019

COE-3
111.0
2019

PZ-1
1.2
2019

PZ-2
0.5 U
2019

MW-101S
0.5 U
2019

MW-102
0.5 U
2019

W98-1
13.0
2019

CDW-1
0.5 U
2019

MW-101D
0.5 U
2019

COE-5
0.5 U
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF TRICHLOROETHENE DETECTED IN GROUNDWATER SAMPLES 2019

North Kingstown, Rhode Island

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Figure 5-26C

Drawn By: SAV	Approved By: HD
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Project No. R2023018.000.003	Date: 2/1/2024

MW-4
0.5 U
2019

MW-8
0.5 U
2019

MW-10
0.5 U
2019

MW-12
0.5 U
2019

W94-6
0.5 U
2019

MW-21
0.2 J
2019

MW-11
0.2 J
2019

OW-9
11.2 J
2014

WP-5
0.5 U
2019

TS-3-A
9.5
2014

TS-3-B
0.4 J
2014

TS-3-D
39.0
2014

COE-6
0.9 J
2019

OW-3
39.2 J
2014

BMW-3
3.1 J
2014

COE-2
0.5 U
2019

MW-106D
5.4
2019

WP-6
0.5 UJ
2019

CDW-3
0.5 J
2019

OW-3
8.4
2019

BMW-3
5.5
2019

MW-106S
40.0
2019

CDW-2
0.5 U
2019

PZ-1
6.7
2019

W98-1
5.9
2019

PZ-2
0.2 J
2019

MW-101S
0.5 U
2014

MW-101D
0.5 U
2014

CDW-1
0.5 U
2019

MW-101S
0.5 U
2019

MW-101D
0.5 U
2019

COE-5
0.5 U
2019

MW-102
0.5 U
2014

MW-102
0.5 U
2019

MW-103
0.5 U
2014

MW-103
0.5 U
2019

MW-104
0.5 U
2014

MW-104
0.5 U
2019

MW-105
0.5 U
2014

MW-107
0.2 J
2014

MW-107
0.8 J
2019

MW-108D
0.5 UJ
2014

MW-108D
0.5 U
2019

MW-108S
0.5 UJ
2014

MW-108S
0.5 U
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF CIS-1,2-DICHLOROETHENE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

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Figure 5-27

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Former Blue Beach Disposal Area FUDS

SUMMARY OF VINYL CHLORIDE DETECTED IN GROUNDWATER SAMPLES 2014

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-28A

Drawn By: SAV	Approved By: HD
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Project No. R2023018.000.003	Date: 2/1/2024

MW-4
1.0 U
2019

MW-8
1.0 U
2019

MW-10
1.0 U
2019

MW-11
1.0 U
2019

MW-12
1.0 U
2019

W94-6
1.0 U
2019

MW-108S
1.0 U
2019

MW-108D
1.0 U
2019

MW-107
1.0 U
2019

OW-9
1.0 U
2019

WP-5
1.0 U
2019

COE-6
0.3 J
2019

OW-3
1.0 U
2019

COE-2
1.0 U
2019

MW-106D
1.0 U
2019

WP-6
1.0 UJ
2019

BMW-3
1.0 U
2019

MW-106S
7.0
2019

CDW-2
1.0 U
2019

MW-104
1.0 U
2019

MW-103
1.0 U
2019

PZ-1
1.0 U
2019

PZ-2
1.0 U
2019

MW-102
1.0 U
2019

W98-1
1.0 U
2019

CDW-1
1.0 U
2019

MW-101S
1.0 U
2019

MW-101D
1.0 U
2019

COE-5
1.0 U
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF VINYL CHLORIDE DETECTED IN GROUNDWATER SAMPLES 2019

North Kingstown, Rhode Island

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Figure 5-28B

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Former Blue Beach Disposal Area FUDS

SUMMARY OF VINYL CHLORIDE DETECTED IN SOIL VAPOR SAMPLES

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/m^3.

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Figure 5-28C

Drawn By: SAV	Approved By: HD
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Project No. R2023018.000.003	Date: 2/1/2024

MW-4
0.5 U
2019

MW-8
0.5 U
2019

MW-10
0.5 U
2019

MW-12
0.5 U
2019

W94-6
0.5 U
2019

MW-11
0.5 U
2019

OW-9
0.5 U
2019

MW-108D
0.5 U
2014

MW-108D
0.5 U
2019

MW-108S
1.7
2014

MW-108S
1.5
2019

MW-107
5.8
2014

MW-107
0.5 U
2019

WP-5
0.5 U
2019

TS-3-A
1.5
2014

TS-3-C
0.2 J
2014

TS-3-B
0.1 J
2014

TS-3-D
3.7
2014

MW-105
0.5 U
2014

COE-6
0.5 U
2019

OW-3
5.0 U
2014

BMW-3
0.6 J
2014

COE-2
0.5 U
2019

MW-106D
0.5 U
2019

WP-6
0.5 UJ
2019

OW-3
1.4
2019

BMW-3
0.5 U
2019

MW-104
0.5 U
2014

MW-104
0.5 U
2019

MW-103
0.5 U
2014

MW-103
0.5 U
2019

MW-106S
0.5 U
2019

CDW-2
0.5 U
2019

PZ-1
0.5 U
2019

PZ-2
0.5 U
2019

MW-101S
0.5 U
2014

MW-101D
0.5 U
2014

MW-102
0.5 U
2014

MW-101S
0.5 U
2019

MW-101D
0.5 U
2019

MW-102
0.5 U
2019

W98-1
0.5 U
2019

CDW-1
0.5 U
2019

COE-5
0.5 U
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF TETRACHLOROETHENE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

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Figure 5-29

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Project No. R2023018.000.003	Date: 2/1/2024

MW-4
0.5 U
2019

MW-8
0.5 U
2019

MW-10
0.5 U
2019

MW-12
0.5 U
2019

W94-6
0.5 U
2019

MW-11
0.5 U
2019

WP-5
0.5 U
2019

OW-9
0.3 U
2014

OW-9
0.5 U
2019

COE-6
0.5 U
2019

OW-3
2.0 U
2014

BMW-3
0.2 U
2014

BMW-3
0.5 U
2019

COE-2
0.5 U
2019

MW-106D
0.5 U
2019

WP-6
0.5 UJ
2019

MW-106S
0.5 U
2019

CDW-2
0.5 U
2019

OW-3
0.5 U
2019

PZ-1
0.5 U
2019

PZ-2
0.5 U
2019

W98-1
0.5 U
2019

MW-101S
0.2 U
2014

MW-101D
0.2 U
2014

MW-101S
0.5 U
2019

MW-101D
0.5 U
2019

CDW-1
0.5 U
2019

COE-5
0.5 U
2019

MW-107
0.2 J
2014

MW-107
0.5 U
2019

MW-108D
0.2 U
2014

MW-108D
0.5 U
2019

MW-108S
0.2 U
2014

MW-108S
0.5 U
2019

MW-105
0.2 U
2014

MW-102
0.2 U
2014

MW-102
0.5 U
2019

MW-103
0.2 U
2014

MW-103
0.5 U
2019

MW-104
0.2 U
2014

MW-104
0.5 U
2019

Former Blue Beach Disposal Area FUDS

SUMMARY OF 1,1,2,2-TETRACHLOROETHANE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-30

Drawn By: SAV	Approved By: HD
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Project No. R2023018.000.003	Date: 2/1/2024

MW-4
0.5 U
2019

MW-8
0.5 U
2019

MW-10
0.5 U
2019

MW-12
0.5 U
2019

W94-6
0.5 U
2019

MW-11
0.5 U
2019

MW-107
0.4 J
2014

MW-107
0.5 U
2019

MW-108D
0.5 U
2014

MW-108D
0.5 U
2019

MW-108S
0.5 U
2014

MW-108S
0.5 U
2019

WP-5
0.5 U
2019

OW-9
0.5 U
2014

OW-9
0.5 U
2019

MW-105
0.5 U
2014

COE-6
0.5 U
2019

OW-3
5.0 U
2014

BMW-3
0.5 U
2014

COE-2
0.5 U
2019

MW-106D
0.5 U
2019

WP-6
0.5 UJ
2019

BMW-3
0.5 U
2019

MW-104
0.5 U
2014

MW-106S
0.5 U
2019

CDW-2
0.5 U
2019

OW-3
0.5 U
2019

MW-103
0.5 U
2014

MW-103
0.5 U
2019

MW-104
0.5 U
2019

PZ-1
0.5 U
2019

PZ-2
0.5 U
2019

MW-101S
0.5 U
2014

MW-101D
0.5 U
2014

MW-102
0.5 U
2014

W98-1
0.5 U
2019

CDW-1
0.5 U
2019

MW-101S
0.5 U
2019

MW-101D
0.5 U
2019

MW-102
0.5 U
2019

COE-5
0.5 U
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF 1,1,2-TRICHLOROETHANE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

Figure 5-31

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Project No. R2023018.000.003	Date: 2/1/2024

MW-4
0.5 U
2019

MW-8
0.5 U
2019

MW-10
0.5 U
2019

MW-12
0.5 U
2019

W94-6
0.5 U
2019

MW-11
0.5 U
2019

MW-108D
0.5 U
2014

MW-108S
0.5 U
2014

MW-108D
0.5 U
2019

MW-108S
0.5 U
2019

MW-107
0.5 U
2019

MW-107
0.5 U
2014

WP-5
0.5 U
2019

OW-9
0.5 U
2014

OW-9
0.5 U
2019

TS-3-C
0.3 J
2014

TS-3-D
3.2
2014

MW-105
0.5 U
2014

COE-6
0.5 U
2019

OW-3
5.0 U
2014

BMW-3
0.5 U
2014

MW-104
0.5 U
2014

COE-2
0.5 U
2019

MW-106D
0.5 U
2019

WP-6
0.5 UJ
2019

BMW-3
0.5 U
2019

MW-104
0.5 U
2019

MW-103
0.5 U
2014

MW-106S
0.3 J
2019

OW-3
0.5 U
2019

CDW-2
0.5 U
2019

MW-103
0.5 U
2019

PZ-1
0.5 U
2019

PZ-2
0.5 U
2019

MW-101S
0.5 U
2014

MW-101D
0.5 U
2014

MW-102
0.5 U
2014

W98-1
0.5 U
2019

MW-101S
0.5 U
2019

MW-101D
0.5 U
2019

CDW-1
0.5 U
2019

MW-102
0.5 U
2019

COE-5
0.5 U
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF 1,1-DICHLOROETHANE DETECTED IN GROUNDWATER SAMPLES

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Figure 5-32

Drawn By: SAV	Approved By: HD
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Project No. R2023018.000.003	Date: 2/1/2024

MW-4
0.50 U
2019

MW-8
0.50 U
2019

MW-10
0.50 U
2019

MW-12
0.50 U
2019

W94-6
0.50 U
2019

MW-11
0.50 U
2019

WP-5
0.50 U
2019

OW-9
0.50 U
2014

OW-9
0.50 U
2019

TS-3-D
0.94
2014

COE-6
0.50 U
2019

COE-2
0.50 U
2019

MW-106D
0.50 U
2019

WP-6
0.50 UJ
2019

OW-3
5.00 U
2014

BMW-3
0.50 U
2014

BMW-3
0.50 U
2019

MW-106S
0.50 U
2019

CDW-2
0.50 U
2019

OW-3
0.50 U
2019

PZ-1
0.50 U
2019

PZ-2
0.50 U
2019

W98-1
0.50 U
2019

COE-5
0.50 U
2019

CDW-1
0.50 U
2019

MW-101S
0.50 U
2014

MW-101S
0.50 U
2019

MW-101D
0.50 U
2014

MW-101D
0.50 U
2019

MW-102
0.50 U
2014

MW-102
0.50 U
2019

MW-103
0.50 U
2014

MW-103
0.50 U
2019

MW-104
0.50 U
2014

MW-104
0.50 U
2019

MW-105
0.50 U
2014

MW-107
0.50 U
2019

MW-107
0.50 U
2014

MW-108D
0.50 U
2014

MW-108D
0.50 U
2019

MW-108S
0.50 U
2014

MW-108S
0.50 U
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF 1,2-DICHLOROPROPANE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

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Figure 5-33

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SB-201 (8-10)
3,520 J

SB-202 (21-25)
2,530 J

SB-203 (8-10)
3,190 J

SB-216 (8-10)
6,780 J

SB-204 (8-10)
6,200 J

SB-205 (7-9)
6,860 J

SB-214 (6-8)
4,100 J

SB-206 (8-10)
1,190 J

SB-213 (6-8)
140 J

SB-207 (8-10)
19,800 J

SB-208 (8-10)
1,040 J

SB-209 (8-10)
13,400

SB-210 (8-10)
13,600 J

SB-217 (8-10)
1,530 J

SS-3A (2-4)
0 U

SB-106 (3-5)
0 U

NOTES

= Sample result does not exceed a screening level.

= Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Numbers in parentheses represent sample depth interval.

Former Blue Beach Disposal Area FUDS

SUMMARY OF NAPHTHALENE DETECTED IN OFF-PROJECT SUBSURFACE SOIL

North Kingstown, Rhode Island

Figure 5-34A

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MW-4
57.0
2019

MW-8
35.0
2019

MW-10
190.0
2019

MW-12
270.0
2019

W94-6
170.0
2019

BB-4
250.0
2019

MW-108D
0.5 U
2014

MW-108S
0.5 U
2014

MW-11
0.4
2019

TS-UP-1
0.2 J
2014

BB-3
160.0 J
2019

MW-108D
0.1 U
2019

MW-108S
0.1 UJ
2019

WP-5
34.0
2019

TS-UP-2
0.2 J
2014

MW-107
0.3 J
2014

MW-107
0.1 J
2019

OW-9
0.5 U
2014

OW-9
0.1 U
2019

CDW-4
26.0 J
2019

TS-3-A
780.0
2014

MW-105
0.8 J
2014

TS-3-B
1.8 J
2014

TS-3-C
0.2 J
2014

COE-6
0.1 U
2019

OW-3
5.0 U
2014

COE-2
0.1 U
2019

MW-106D
0.1 UJ
2019

WP-6
0.1 U
2019

BMW-3
0.5 U
2014

OW-3
0.1 U
2019

BMW-3
0.1 U
2019

MW-104
0.5 U
2014

MW-104
0.1 U
2019

MW-106S
0.1 U
2019

CDW-2
0.1 U
2019

MW-102
0.5 U
2014

MW-103
0.5 U
2014

MW-103
0.1 U
2019

PZ-2
0.1 U
2019

PZ-1
0.1 U
2019

MW-101S
0.5 U
2014

MW-101D
0.5 U
2014

MW-102
0.1 U
2019

W98-1
0.1 U
2019

MW-101S
0.1 U
2019

MW-101D
0.1 U
2019

CDW-1
0.1 U
2019

COE-5
0.1 U
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF NAPHTHALENE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

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Figure 5-34B

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Former Blue Beach Disposal Area FUDS

SUMMARY OF NAPHTHALENE DETECTED IN OFF-PROJECT SURFACE WATER

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-34C

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Former Blue Beach Disposal Area FUDS

SUMMARY OF 1,2,3-TRICHLOROBENZENE DETECTED IN OFF-PROJECT SURFACE WATER

North Kingstown, Rhode Island

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Figure 5-35

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EA20VP (8-12)
0 U

GP-TR3B 6-6.5 (6-7)
12,400

GP-TR1 5-7 (5-7)
63,300

GP-TR2 6-8 (6-8)
14,200

SB-307 (1-3)
3 U

GP2-TR2A 6-7 (6-7)
4 U

SB-308 (1-3)
3 U

GP2-TR2D 6-7 (6-7)
4 U

GP2-TR1B 6-6.5 (6-7)
4 U

SB-309 (1-3)
2 U

SB-310 (1-3)
2 UJ

SB-311 (1-3)
2 U

SB-316 (1-3)
3 UJ

SB-312 (1-3)
2 U

SB-314 (1-3)
2 U

SB-315 (1-3)
2 U

SB-101 (8-12)
2 J

SB-313 (1-3)
3 U

SB-108 (14-20)
4 U

SB-107 (7-9)
5 U

SB-105 (8-10)
4 U

SB-326 (1-3)
3 U

SB-324 (1-3)
1 U

SB-322 (1-3)
3 U

SB-325 (1-3)
3 U

SB-104 (5-7)
5

SB-320 (1-3)
2 U

SB-323 (1-3)
2 U

SB-318 (1-3)
3 U

SB-321 (1-3)
2 U

SB-319 (1-3)
3 U

SB-102 (5-7)
4 J

SB-103 (4-6)
7

SB-317 (1-3)
2 U

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Numbers in parentheses represent sample depth interval.

Former Blue Beach Disposal Area FUDS

SUMMARY OF 1,2,4-TRIMETHYLBENZENE DETECTED IN ON-PROJECT SUBSURFACE SOIL

North Kingstown, Rhode Island

Figure 5-36A

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MW-4
210.0
2019

MW-8
200.0
2019

MW-10
220.0
2019

MW-12
140.0
2019

W94-6
87.0
2019

BB-4
320.0 J
2019

BB-3
8.1
2019

MW-108D
0.2 U
2014

MW-108S
0.2 U
2014

MW-108D
0.3 J
2019

MW-108S
0.5 U
2019

MW-107
0.5 U
2019

MW-107
0.3 J
2014

COE-7
0.4 J
2019

MW-11
0.5 U
2019

TS-3-A
11.0
2014

WP-5
45.0
2019

CDW-4
31.0
2019

OW-9
0.3 U
2014

OW-9
0.5 U
2019

TS-3-B
0.1 J
2014

TS-3-C
0.1 J
2014

MW-105
0.3 J
2014

COE-6
0.5 U
2019

OW-3
2.0 U
2014

BMW-3
0.2 U
2014

MW-104
0.2 U
2014

COE-2
0.5 U
2019

MW-106D
0.5 U
2019

WP-6
0.5 UJ
2019

CDW-3
0.3 J
2019

BMW-3
0.5 U
2019

MW-104
0.5 U
2019

MW-106S
0.5 U
2019

OW-3
0.5 U
2019

MW-103
0.2 U
2014

MW-103
0.5 U
2019

CDW-2
0.5 U
2019

PZ-1
0.5 U
2019

PZ-2
0.5 U
2019

MW-101S
0.2 U
2014

MW-101D
0.2 U
2014

MW-102
0.2 U
2014

W98-1
0.5 U
2019

MW-101S
0.5 U
2019

MW-101D
0.5 U
2019

MW-102
0.5 U
2019

CDW-1
0.5 U
2019

COE-5
0.5 U
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF 1,2,4-TRIMETHYLBENZENE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

Figure 5-36B

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SUMMARY OF 2-BUTANONE DETECTED IN OFF-PROJECT SEDIMENT

North Kingstown, Rhode Island

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Figure 5-37

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Former Blue Beach Disposal Area FUDS

SUMMARY OF 2,4-DICHLOROPHENOL DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-38

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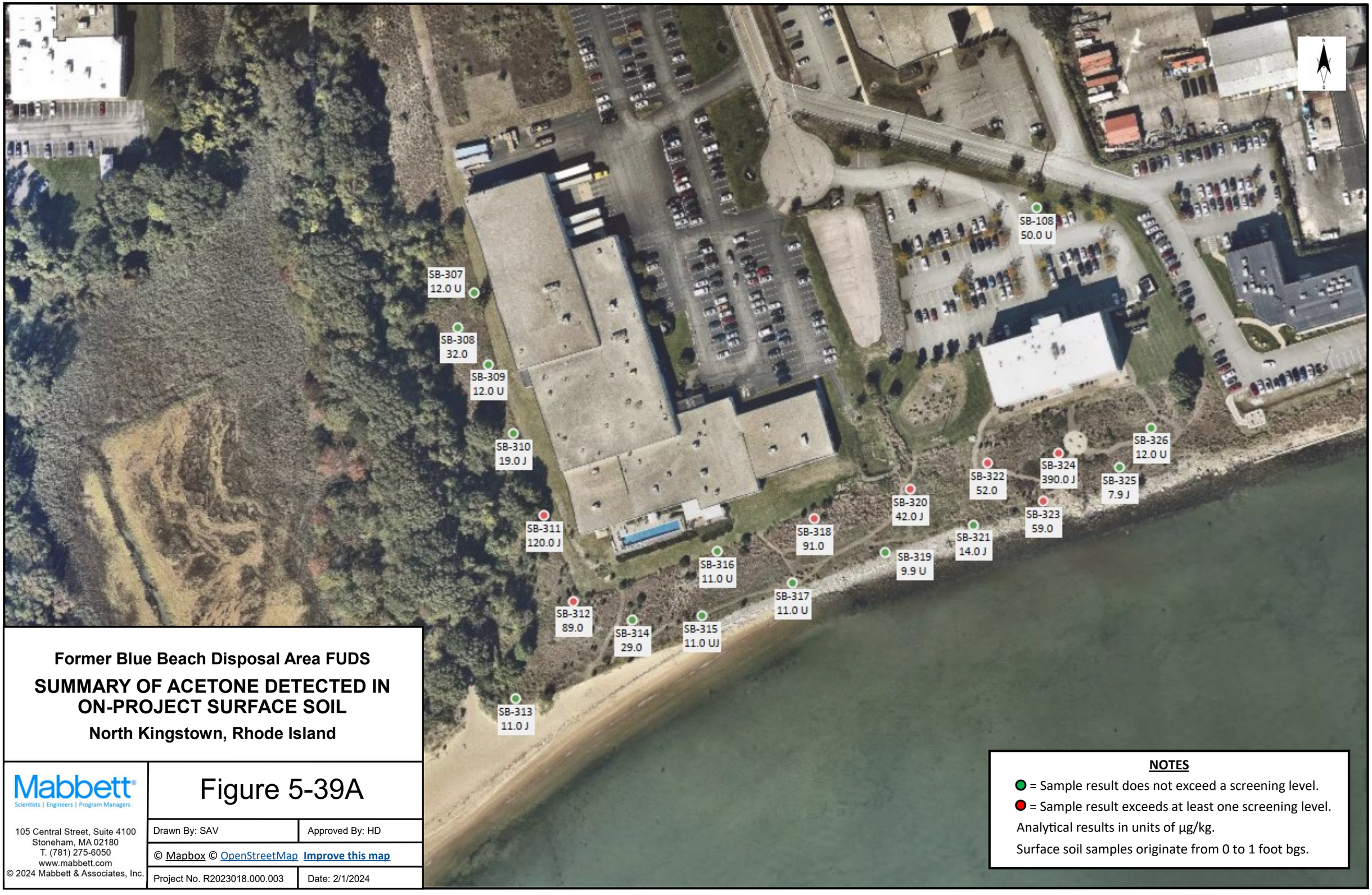

Former Blue Beach Disposal Area FUDS

SUMMARY OF ACETONE DETECTED IN ON-PROJECT SURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-39A

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Former Blue Beach Disposal Area FUDS

SUMMARY OF ACETONE DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-39B

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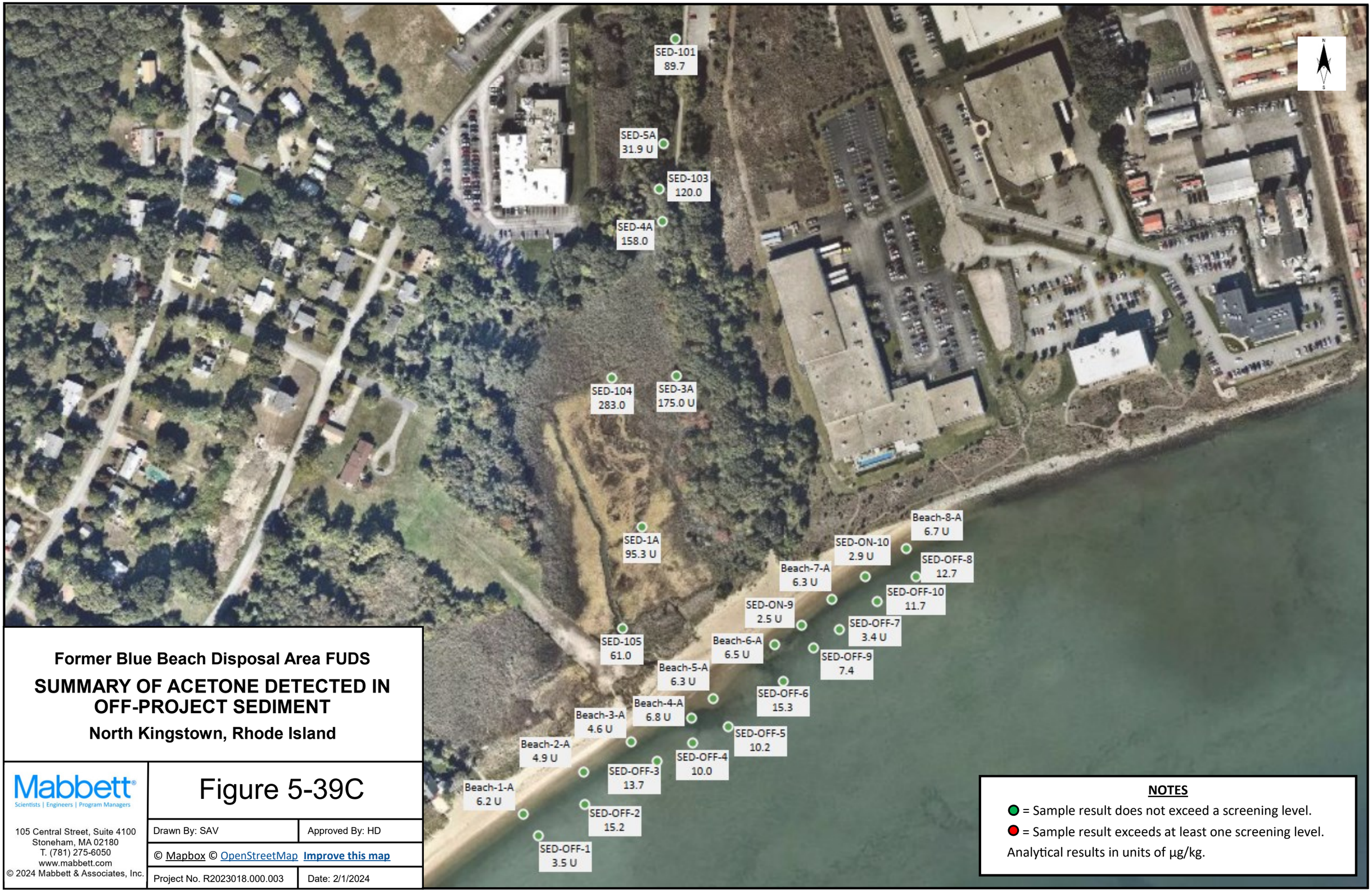

Former Blue Beach Disposal Area FUDS

SUMMARY OF ACETONE DETECTED IN OFF-PROJECT SEDIMENT

North Kingstown, Rhode Island

NOTES

= Sample result does not exceed a screening level.

= Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

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Figure 5-39C

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Former Blue Beach Disposal Area FUDS

SUMMARY OF CARBON DISULFIDE DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-40A

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Former Blue Beach Disposal Area FUDS

SUMMARY OF CARBON DISULFIDE DETECTED IN OFF-PROJECT SEDIMENT

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

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Figure 5-40B

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Former Blue Beach Disposal Area FUDS

SUMMARY OF CARBON DISULFIDE DETECTED IN SURFACE WATER

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-40C

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PW-I
0.3 U

PW-101
1.0 U

PW-H
0.3 U

PW-1-2014
0.6 J

PW-102
1.0 U

PW-2-2014
1.1

PW-3-2014
0.6 J

PW-TS1A
0.3 U

PW-C
0.3 U

PW-103
1.0 U

PW-E
0.3 U

PW-F
0.3 U

PW-104
1.0 U

PW-4-2014
0.9

PW-ON-8
5.0 U

PW-5
1.0 U

PW-OFF-8
5.0 U

PW-ON-10
5.0 U

PW-TS1C
0.3 U

PW-ON-7
5.0 U

PW-4
1.0 U

PW-3
1.0 U

PW-105
1.0 U

PW-5-2014
0.2 J

PW-ON-9
5.0 U

PW-OFF-7
5.0 U

PW-2
1.0 U

PW-OFF-9
5.0 U

PW-1
1.0 U

PW-ON-6
5.0 U

PW-ON-5
5.0 U

PW-OFF-6
5.0 U

PW-ON-4
5.0 U

PW-ON-3
5.0 U

PW-OFF-5
5.0 U

PW-OFF-4
5.0 U

PW-ON-2
5.0 U

PW-OFF-3
5.0 U

PW-ON-1
5.0 U

PW-OFF-2
5.0 U

PW-OFF-1
5.0 U

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF CARBON DISULFIDE DETECTED IN PORE WATER

North Kingstown, Rhode Island

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Figure 5-40D

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MW-4
0.5 U
2019

MW-8
0.5 U
2019

MW-10
0.5 U
2019

MW-12
0.5 U
2019

W94-6
0.5 U
2019

MW-11
0.5 U
2019

MW-108D
0.5 U
2014
MW-108D
0.5 U
2019

MW-108S
0.5 U
2014

MW-108S
0.5 U
2019

MW-107
0.5 U
2019

MW-107
0.5 U
2014

WP-5
0.5 U
2019

OW-9
0.5 U
2014

OW-9
0.5 U
2019

TS-3-C
0.1 J
2014

TS-3-D
0.6
2014

COE-6
0.5 U
2019

MW-105
0.5 U
2014

OW-3
5.0 U
2014

BMW-3
0.5 U
2014

COE-2
0.5 U
2019

MW-106D
0.5 U
2019

WP-6
0.5 UJ
2019

BMW-3
0.5 U
2019

MW-104
0.5 U
2014

MW-104
0.5 U
2019

OW-3
0.5 U
2019

MW-103
0.5 U
2014
MW-103
0.5 U
2019

MW-106S
0.5 U
2019

CDW-2
0.5 U
2019

PZ-1
0.5 U
2019

PZ-2
0.5 U
2019

MW-101S
0.5 U
2014

MW-101D
0.5 U
2014

MW-102
0.5 U
2014

W98-1
0.5 U
2019

MW-101S
0.5 U
2019

MW-101D
0.5 U
2019

CDW-1
0.5 U
2019

MW-102
0.5 U
2019

COE-5
0.5 U
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF CHLOROFORM DETECTED IN GROUNDWATER SAMPLES

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Figure 5-41

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Former Blue Beach Disposal Area FUDS

SUMMARY OF BENZENE DETECTED IN SOIL VAPOR SAMPLES

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/m^3.

Figure 5-42

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Former Blue Beach Disposal Area FUDS

SUMMARY OF ETHYLBENZENE DETECTED IN ON-PROJECT SUBSURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Numbers in parentheses represent sample depth interval.

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Figure 5-43A

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Former Blue Beach Disposal Area FUDS

SUMMARY OF ETHYLBENZENE DETECTED IN OFF-PROJECT SUBSURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Numbers in parentheses represent sample depth interval.

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Figure 5-43B

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MW-4
2.3
2019

MW-8
11.0
2019

MW-10
28.0
2019

MW-12
4.8
2019

W94-6
14.0
2019

BB-4
4.8 J
2019

BB-3
4.3
2019

MW-11
0.5 U
2019

MW-108D
0.2 U
2014

MW-108D
0.5 U
2019

MW-108S
0.2 U
2014

MW-108S
0.5 U
2019

MW-107
0.2 U
2014

MW-107
0.5 U
2019

WP-5
0.5 U
2019

TS-3-A
7.5
2014

TS-3-A
0.1 J
2014

OW-9
0.3 U
2014

OW-9
0.5 U
2019

TS-3-C
0.1 J
2014

MW-105
0.2 J
2014

OW-3
2.0 U
2014

BMW-3
0.2 U
2014

BMW-3
0.5 U
2019

OW-3
0.5 U
2019

COE-2
0.5 U
2019

MW-106D
0.5 U
2019

WP-6
0.5 UJ
2019

MW-106S
0.5 U
2019

CDW-2
0.5 U
2019

MW-104
0.2 U
2014

MW-104
0.5 U
2019

MW-103
0.2 U
2014

MW-103
0.5 U
2019

PZ-1
0.5 U
2019

PZ-2
0.5 U
2019

W98-1
0.5 U
2019

MW-101S
0.2 U
2014

MW-101D
0.2 U
2014

MW-101S
0.5 U
2019

MW-101D
0.5 U
2019

MW-102
0.2 U
2014

MW-102
0.5 U
2019

CDW-1
0.5 U
2019

COE-5
0.5 U
2019

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

Former Blue Beach Disposal Area FUDS

SUMMARY OF ETHYLBENZENE DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

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Figure 5-43C

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EA20VP (8-12)
210.0 U

EA27VP (8-12)
1.0 U

GP-TR1 5-7 (5-7)
9,170.0

SB-307 (1-3)
7.4 U

GP-TR3B 6-6.5 (6-7)
1,694.0

GP-TR2 6-8 (6-8)
488,000.0

GP2-TR2A 6-7 (6-7)
17.1 J

GP2-TR2D 6-7 (6-7)
15.6 J

GP2-TR1B 6-6.5 (6-7)
17.2

SB-308 (1-3)
1.5 J

SB-309 (1-3)
6.5 U

SB-310 (1-3)
7.1 UJ

SB-311 (1-3)
6.4 U

SB-312 (1-3)
7.1 U

SB-313 (1-3)
7.4 U

SB-314 (1-3)
7.2 U

SB-315 (1-3)
7.0 U

SB-316 (1-3)
7.4 UJ

SB-317 (1-3)
6.8 U

SB-318 (1-3)
7.5 U

SB-319 (1-3)
7.4 U

SB-320 (1-3)
7.0 U

SB-321 (1-3)
6.5 U

SB-322 (1-3)
7.5 U

SB-323 (1-3)
6.4 U

SB-324 (1-3)
3.6 U

SB-325 (1-3)
9.8 U

SB-326 (1-3)
8.2 U

SB-101 (8-12)
2.2 U

SB-102 (5-7)
4.0 U

SB-103 (4-6)
3.4 U

SB-104 (5-7)
2.7 U

SB-105 (8-10)
3.7 U

SB-107 (7-9)
5.3 U

Former Blue Beach Disposal Area FUDS

SUMMARY OF TOTAL XYLENES DETECTED IN ON-PROJECT SUBSURFACE SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Numbers in parentheses represent sample depth interval.

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Figure 5-44A

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MW-4
5.2
2019

MW-8
130.0
2019

MW-10
120.0
2019

MW-12
10.0
2019

W94-6
0.3 J
2019

BB-4
41.0 J
2019

MW-11
1.5 U
2019

OW-9
1.5 U
2019

WP-5
1.5 U
2019

MW-108D
1.5 U
2019

MW-108S
1.5 U
2019

MW-107
1.5 U
2019

COE-6
1.5 U
2019

COE-2
1.5 U
2019

MW-106D
1.5 U
2019

WP-6
1.5 UJ
2019

OW-3
1.5 U
2019

BMW-3
1.5 U
2019

MW-106S
1.5 U
2019

CDW-2
1.5 U
2019

MW-104
1.5 U
2019

MW-103
1.5 U
2019

PZ-1
1.5 U
2019

PZ-2
1.5 U
2019

MW-102
1.5 U
2019

W98-1
1.5 U
2019

CDW-1
1.5 U
2019

MW-101S
1.5 U
2019

MW-101D
1.5 U
2019

COE-5
1.5 U
2019

Former Blue Beach Disposal Area FUDS

SUMMARY OF TOTAL XYLENES DETECTED IN GROUNDWATER SAMPLES

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-44B

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Former Blue Beach Disposal Area FUDS

SUMMARY OF TOLUENE DETECTED IN OFF-PROJECT SURFACE HYDRIC SOIL

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/kg.

Surface soil samples originate from 0 to 1 foot bgs.

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Figure 5-45A

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PW-I
2.8

PW-101
1.0 U

PW-H
0.3 U

PW-102
1.0 U

PW-TS1A
0.3 U

PW-103
1.0 U

PW-C
0.3 U

PW-E
0.3 U

PW-F
0.3 U

PW-104
1.0 U

PW-4-2014
0.3 U

PW-5
1.0 U

PW-ON-8
5.0 U

PW-OFF-8
5.0 U

PW-ON-10
5.0 U

PW-TS1C
0.3 U

PW-ON-7
5.0 U

PW-4
1.0 U

PW-3
1.0 U

PW-OFF-10
5.0 U

PW-105
1.0 U

PW-ON-9
5.0 U

PW-OFF-7
5.0 U

PW-2
1.0 U

PW-1
1.0 U

PW-ON-6
5.0 U

PW-OFF-9
5.0 U

PW-OFF-6
5.0 U

PW-ON-5
5.0 U

PW-ON-4
5.0 U

PW-OFF-5
5.0 U

PW-ON-3
5.0 U

PW-OFF-4
5.0 U

PW-OFF-3
5.0 U

PW-ON-2
5.0 U

PW-OFF-2
5.0 U

PW-ON-1
5.0 U

Former Blue Beach Disposal Area FUDS

SUMMARY OF TOLUENE DETECTED IN PORE WATER SAMPLES

North Kingstown, Rhode Island

NOTES

● = Sample result does not exceed a screening level.

● = Sample result exceeds at least one screening level.

Analytical results in units of µg/L.

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Figure 5-45B

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Former Blue Beach Disposal Area FUDS

SUMMARY OF N-HEPTANE DETECTED IN SOIL VAPOR SAMPLES

North Kingstown, Rhode Island

NOTES

- = Sample result does not exceed a screening level.
- = Sample result exceeds at least one screening level.

Analytical results in units of µg/m^3.

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Figure 5-46

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APPENDIX A

Human Health and Ecological Risk Assessment Report

AECOM Imagine it. Delivered.

DRAFT FINAL Human Health and Ecological Risk Assessment Report

Former Blue Beach Disposal Area
North Kingstown, Rhode Island

U.S. Army Corp of Engineers

DERP FUDS Project and Property Number: D01RI0488 01

April 2021

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Attachment I Macroinvertebrate Community Results

Attachment J Supporting Documentation for Tidal Stream Biological Evaluation

J-1 Spearman Rank Order Correlation Tests

J-2 Derivation of Reference Envelope Values and Application in Sediment Quality Triad Evaluation

Acronyms

%	percent
<	less than
>	greater than
µg/L	microgram per liter
µg/m^3	microgram per cubic meter
µg/mg	microgram per milligram
ABS_{GI}	fraction of chemical absorbed in gastrointestinal tract
ADAF	age-dependent adjustment factors
ADD	average daily dose
ADE	average daily exposure
ATSDR	Agency for Toxic Substances and Disease Registry
AUF	area use factor
AVS	Acid Volatile Sulfide
AWQC	Ambient Water Quality Criteria
BAF	bioaccumulation factors
BERA	baseline ecological risk assessment
bgs	below ground surface
BSAF	biota-sediment accumulation factor
BTV	background threshold value
BTAG	Biological Technical Assistance Group
CAS	Chemical Abstracts Service
COC	chemical of concern
CENAE	United States Army Corps of Engineers, New England District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	chemical of potential concern
CSM	conceptual site model
CV	coefficient of variation
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
Eco-SSLs	Ecological Soil Screening Levels
ELCR	excess lifetime cancer risk

ELUR	environmental land use restriction
EPC	exposure point concentration
EqP	equilibrium partitioning
ERA	ecological risk assessment
ESV	ecological screening values
FOD	frequency of detection
FS	feasibility study
ft	feet
FUDS	formerly used defense site
HEAST	Health Effects Assessment Summary Tables
HHRA	human health risk assessment
HI	hazard index
HMW	high molecular weight
HQ	hazard quotient
IRIS	Integrated Risk Information System
ISM	incremental sampling methodology
ITRC	Interstate Technology Regulatory Council
KM	Kaplan-Meier
LADD	lifetime average daily dose
LADE	lifetime average daily exposure
LMW	low molecular weight
LOAEL	lowest observed adverse effect level
LOD	level of detection
Mabbett	Mabbett & Associates, Inc.
MCL	Maximum Contaminant Level
mg/kg	milligram per kilogram
mg/kg-day	milligram per kilogram per day
mg/m^3	milligram per cubic meter
MRL	Minimal Risk Levels
NAS	Naval Air Station
NCEA	National Center for Environmental Assessment
NOAA	National Oceanic and Atmospheric Administration

NOAEL	no observed adverse effect level
OEHHA	Office of Environmental Health and Hazard Assessment
ORNL	Oak Ridge National Laboratory
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PEF	particulate emission factor
PPRTV	Provisional Peer-Reviewed Toxicity Values
QDC	Quonset Development Corporation
RAGS	Risk Assessment Guidance for Superfund
RAWP	risk assessment work plan
RI	remedial investigation
RIDEM	Rhode Island Department of Environmental Management
RSL	Regional Screening Level
SAP	sampling and analysis plan
SDWA	Safe Drinking Water Act
SEM	Simultaneously Extracted Metals
SLERA	screening level ecological risk assessment
SMDP	scientific/management decision point
SU	sampling unit
SVOC	semi-volatile organic compound
TAL	target analyte list
TDD	total daily dose
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TRV	toxicity reference values
TSERAWG	Tri-Services Environmental Risk Assessment Work Group
UCL	upper confidence limit
UPS	upland soil sampling area
USACE	United States Army Corp of Engineers
USEPA	United States Environmental Protection Agency
UU/UE	unlimited use/unrestricted exposure
VISL	Vapor Intrusion Screening Level

1. Introduction

A baseline human health risk assessment (HHRA) and ecological risk assessment (ERA) have been conducted in support of the Comprehensive Remedial Investigation (RI) for the Former Blue Beach Disposal Area Formerly Used Defense Site (FUDS) in North Kingstown, Rhode Island (the Project). The HHRA and ERA were performed by AECOM on behalf of Mabbett & Associates, Inc. (Mabbett) for the United States Army Corps of Engineers (USACE), New England District (CENAE), in accordance with the Updated Risk Assessment Work Plan (RAWP) included as Appendix E to the Sampling and Analysis Plan (SAP) for the Comprehensive Remedial Investigation for the Former Blue Beach Disposal Area FUDS (Mabbett, 2019).

The primary objectives of the HHRA and ERA are to evaluate the potential risk/hazard to human and ecological receptors associated with exposure to chemicals detected in soil, hydric soil, groundwater, porewater, sediment, surface water, and soil vapor that are attributable to past operations at the Former Blue Beach Disposal Area FUDS. The HHRA and ERA were performed in accordance with the United States Environmental Protection Agency (USEPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and USACE risk assessment guidance, as available/applicable.

1.1 Project Background and Setting

The Project is located in the southern portion of the Quonset Business Park (formerly the Quonset Point Naval Air Station [NAS]) in the town of North Kingstown, Rhode Island approximately 20 miles south of Providence, Rhode Island. The Quonset Business Park is managed by the Quonset Development Corporation (QDC), a quasi-public agency overseen by the Rhode Island Economic Development Corporation. **Figure 1-1** is a Site Location map that shows the current footprint of the Site as well as surrounding areas.

The Project area encompasses approximately 12.5 acres consisting of relatively flat, developed land consisting of five real parcels. The western portion of the Project area is currently owned by Hayward Industrials, Inc., and operated by Goldline Properties, LLC, which has its headquarters and manufacturing facility within the Project area. The eastern portion of the Project area is owned by Falvey Realty, LLC, which operates the Falvey Cargo Company within the Project area. The Project area is bordered to the north by the former Kiefer Park Tank Farm (Kiefer Park) which is currently undeveloped property, to the south by beach front (Blue Beach) and Narragansett Bay, to the east by an industrial park, and to the west by a paved walking path that extends from Circuit Drive to Blue Beach, and a wetland, salt marsh and an associated tidal stream on the other side of the path referred to as the Red Maple Swamp/tidal stream.

The Project property was formerly used as a salvage yard for the storage and disposal of vehicle parts, machinery, construction debris, drummed materials, and miscellaneous wastes during its operation by Quonset Point NAS from 1940 to 1974. The property was acquired by the Department of Defense (DoD) and used until its deactivation in 1974 by the Department of the Navy. It was then conveyed to the Rhode Island Port Authority in 1978 for redevelopment.

Various investigation and remediation activities have been performed at the Project beginning in the early 1980s. Historic investigations have overlapped with investigations at Kiefer Park, adjacent to the Project to the north. A baseline risk assessment was conducted in 1997 for the combined area consisting of the Blue Beach Disposal Area and Kiefer Park (GZA, 1997). Since the time the risk assessment was prepared by GZA, additional investigation has been performed to fill data gaps, including the collection of data for various media present on the Project and off-Project areas. The RI report provides further details on the past investigations conducted on and in the vicinity of the Project.

Following preliminary assessment of data obtained during field investigation work performed through 2015, it was determined that additional data collection was needed to fill the following data gaps in order to perform a CERCLA-compliant risk assessment.

- Conduct further sampling and analysis of polychlorinated biphenyls (PCBs) (Aroclors), polycyclic aromatic hydrocarbons (PAHs), and metals in on-Project Blue Beach area soils to obtain an appropriate soil dataset that reflects current soil conditions; i.e., soils not removed by previously conducted excavations or buried under a USEPA-approved cap.

- Collect additional soil data in the on-Project Blue Beach area, soil, hydric soil and sediment data in the off-Project Red Maple Swamp/tidal marsh area, and sediment data in the off-Project beach front area to obtain a large enough datasets for calculation of media/area/chemical-specific exposure point concentrations (EPCs) equal to the 95 percent (%) upper confidence limits (UCLs), rather than the maximum detected concentrations.
- Collect an appropriate media-specific background dataset to enable a statistical comparison of Site-specific concentrations to those that represent naturally occurring or local anthropogenic background sources to distinguish and focus recommendations for remedial action on Site-related impacts only.

A more detailed description of the Site background and the complete set of RI study goals is provided in the RI report.

1.2 Report Organization

This risk assessment report is organized into the following sections:

- Section 1.0: Introduction
- Section 2.0: Analytical Data Summary
- Section 3.0: Human Health Risk Assessment
- Section 4.0: Ecological Risk Assessment
- Section 5.0: Summary and Conclusions
- Section 6.0: References

2. Data Selection and Evaluation

This section summarizes the analytical data collected as part of the 2019-2020 RI field program in addition to data collected from previous investigations selected for evaluation in the HHRA and/or ERA. Environmental data evaluated in the risk assessments include soil, hydric soil, groundwater, porewater, sediment, surface water, and soil vapor collected within the Project and/or adjacent off-Project areas defined below. Available data selected for evaluation in the risk assessments were grouped into one of the following exposure areas presented on **Figure 2-1**:

- On-Project Blue Beach area – within the Former Blue Beach Disposal Area FUDS (e.g., within the jurisdictional Blue Beach FUDS boundary)
- Off-Project Red Maple Swamp/tidal stream area – within the tidal marsh referred to as “Red Maple Swamp” and the adjacent public walking path from Circuit Drive to Blue Beach
- Off-Project Narragansett Bay and Beachfront area – within the Narragansett Bay and Beachfront

The media and areas evaluated in the risk assessments are summarized below:

Media **	On-Project Blue Beach	Off-Project Red Maple Swamp/Tidal Stream	Off-Project Narragansett Bay and Beachfront
Soil	X	X	
Hydric soil		X	
Groundwater	X		
Porewater		X	X
Sediment		X	X
Surface Water		X	X
Soil Vapor	X		
X – Indicates analytical data evaluated for the associated media/area. ** Macroinvertebrate community survey data and sediment toxicity test data were also incorporated into the ERA to further evaluate the exposure of benthic invertebrates to sediment.			

2.1 Summary of Analytical Data Evaluated in the Risk Assessments

A brief description of the environmental data evaluated in the risk assessments is provided below by media. Summary tables of samples and analytical data evaluated in the HHRA are presented in **Attachment A**. Sample location figures are presented in the main body of the RI report.

2.1.1 Soil

Discrete soil samples were collected in the on-Project Blue Beach and off-Project Red Maple Swamp/tidal stream areas during multiple sampling events conducted between 1987 and 2019 from various depth intervals between the ground surface and 16 feet (ft) below ground surface (bgs). Most of the soil samples from the off-Project Red Maple Swamp/tidal stream area were collected from along the walking path. Soil samples were analyzed for target analyte list (TAL) metals, PCB Aroclors, pesticides, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), and total organic carbon (TOC), although not all samples were analyzed for all analytes. Potential impacts due to petroleum products are assessed using the relevant VOC and SVOC data for individual chemicals. Therefore, TPH results were not evaluated in the risk assessments.

Soil samples collected during previous investigations considered not to be representative of current conditions or representative of excavated or inaccessible soils were excluded from evaluation in the HHRA and ERA in accordance with the RAWP provided in the SAP (Mabbett, 2019). These data include soil samples collected over 20 years ago (i.e., 1987 through 1994) and those located under the USEPA-approved cap. The exclusion of these data resulted in the exclusion of all discrete soil data for pesticides and PCB Aroclors (i.e., soil samples located beneath a USEPA-

approved cap and/or collected over 20 years ago) in the on-Project Blue Beach area. There is no evidence of bulk storage or releases of pesticides or off-label pesticide use at the Site, therefore, pesticides are not considered Project-related and were not further assessed.

Soil samples were collected during the 2019 sampling event via the incremental sampling methodology (ISM) within three sampling units (SUs) within the on-Project Blue Beach area and analyzed for PCB Aroclors. Within each of the SUs (referred to as BG-1, BG-5, and the upland soil sampling area [UPS]), triplicate ISM soil samples were collected from a 0 to 1 ft bgs and 1 to 3 ft bgs interval.

Soil samples were grouped into two different depth intervals for evaluation in the risk assessments, as applicable. Surface soil was defined as soil collected at a depth within 0 to 1 ft bgs. Subsurface soil was defined as soil collected at a depth greater than (>)1 ft bgs. Two soil samples were collected from a depth interval that overlaps both the surface and subsurface soil depth intervals (i.e., 0-4 and 0-5 ft bgs). These samples were treated as subsurface soil in the risk assessments. Consistent with CERCLA risk assessment practice (USEPA, 1989), soils deeper than 15 ft bgs were not included in the risk assessments because receptors are not considered to contact these deeper soils. The one exception to this is one soil sample collected from 14.25 to 15.5 ft bgs, which was also included as subsurface soil.

A list of soil samples and a summary of the analytical soil data evaluated in the risk assessments are presented in **Attachment A, Tables A-1a through A-1c**.

2.1.2 Hydric Soil

Hydric soil samples were collected from the off-Project Red Maple Swamp/tidal stream area during sampling events performed in 1994, 2011, and 2019 from 0 to 1 ft bgs and 1 to 2 ft bgs. Hydric soil samples were analyzed for inorganics, PCB Aroclors, pesticides, SVOCs, VOCs, and TOC, although not all samples were analyzed for all analytes. Hydric soil data collected during previous investigations considered not to be representative of current conditions were excluded from evaluation in the HHRA and ERA in accordance with the RAWP provided in the SAP (Mabbett, 2019). These data include hydric soil samples collected over 20 years ago (i.e., 1994). The exclusion of these data resulted in the exclusion of all pesticide data. There is no evidence of bulk storage or releases of pesticides or off-label pesticide use at the Site, therefore, pesticides are not considered Project-related and are not further assessed.

Hydric soil data were grouped into two different depth intervals for evaluation in the risk assessments, as applicable. Surface hydric soil was defined as hydric soil collected from 0 to 1 ft bgs. Subsurface hydric soil was defined as hydric soil collected from 1-2 ft bgs. Redevelopment activities are not anticipated to occur in this area; therefore, hydric subsurface soil is not likely to be available for exposure by human and ecological receptors. Therefore, hydric subsurface soil was not evaluated in the ERA. Hydric subsurface soil was evaluated in the HHRA through the chemical of potential concern (COPC) selection and EPC calculation steps for informational purposes only, as further discussed in Section 3.

A list of hydric soil samples and a summary of the analytical hydric soil data evaluated in the risk assessments are presented in **Attachment A, Tables A-2a and A-2b**.

2.1.3 Groundwater

Groundwater samples were collected from the on-Project Blue Beach, off-Project Red Maple Swamp/tidal stream, and off-Project Narragansett Bay and Beachfront areas during multiple sampling events conducted between 2008 and 2019. Groundwater samples were analyzed for metals, PCBs, pesticides, SVOCs, VOCs, and TPH, although not all samples were analyzed for all analytes. Potential impacts due to petroleum products are assessed using the relevant VOC and SVOC data for individual chemicals. Therefore, TPH results were not evaluated in the risk assessments.

Groundwater data collected from the off-Project areas were not evaluated in the HHRA because there are no complete exposure pathways to groundwater in these areas. The off-Project Red Maple Swamp/tidal stream area is a wetland/salt marsh/creek and is therefore highly unlikely to be redeveloped under a future use scenario, and the land owner (QDC) is currently in the process of recording an Environmental Land Use Restriction (ELUR) on the parcel deed to prohibit the use of groundwater as a potable water source without treatment. As a result, water supply wells

are not likely to be constructed in this area and construction/utility work is also not anticipated to occur. Samples from groundwater wells in this area were used to provide data for consideration in the RI to update the conceptual site model (CSM) and refine groundwater flow patterns. Groundwater samples from the off-Project Narragansett Bay and Beachfront area were collected in 2014 to provide information for use in determining whether collection of sediment and surface water samples within the off-Project Narragansett Bay was appropriate. Based on these groundwater data, sediment and surface water samples were collected in the off-Project Narraganset Bay and Beachfront area for evaluation in the risk assessments. Construction/utility work is not anticipated to occur along the beach/shoreline, and recreational receptors present on the beach were evaluated in the HHRA for potential contact with surface water in Narragansett Bay.

The ERA does not use groundwater data given there are no complete exposure pathways to ecological receptors.

In accordance with the RAWP provided in the SAP (Mabbett, 2019), unfiltered (total) groundwater results from the most recently available groundwater sampling events, conducted in 2014 and 2019, were evaluated in the HHRA. Groundwater data were summarized in two ways for evaluation in the HHRA, as applicable: (1) groundwater collected from all depths, and (2) shallow groundwater, defined as groundwater samples collected less than or equal to 15 ft bgs.

A list of groundwater samples and a summary of the analytical groundwater data evaluated in the HHRA are presented in **Attachment A, Tables A-3a and A-3b**.

2.1.4 Porewater

Porewater samples (unfiltered) were collected in the off-Project Red Maple Swamp/tidal stream and off-Project Narraganset Bay and Beachfront areas during multiple sampling events conducted between 2008 and 2015. Porewater samples were analyzed for inorganics, PCBs, pesticides, SVOCs, and VOCs, although not all samples were analyzed for all analytes. Porewater data are evaluated in the ERA but are not utilized in the HHRA because there are no complete human exposure pathways.

A list of porewater samples and a summary of the analytical porewater data evaluated in the ERA are presented in **Attachment A, Tables A-4a through A-4c**.

2.1.5 Sediment

Sediment samples were collected in the off-Project Red Maple Swamp/tidal stream and off-Project Narraganset Bay and Beachfront areas during multiple sampling events conducted between 1994 and 2020. Sediment samples were analyzed for inorganics, PCBs, pesticides, SVOCs, VOCs, TPH, and TOC although not all samples were analyzed for all analytes. Tidal creek sediments were also collected in 2020 for simultaneously extracted metals (SEM), acid volatile sulfides (AVS) and toxicity testing to support the ERA. Potential impacts due to petroleum products are assessed using the relevant VOC and SVOC data for individual chemicals. Therefore, TPH results were not evaluated in the risk assessments.

Sediment data collected during previous investigations considered not to be representative of current conditions were excluded from evaluation in the HHRA and ERA in accordance with the RAWP provided in the SAP (Mabbett, 2019). These data include sediment samples collected over 20 years ago (i.e., 1994 to 1995). The exclusion of these data resulted in the exclusion of all sediment data for pesticides. There is no evidence of bulk storage or releases of pesticides or off-label pesticide use at the Site, therefore, pesticides are not considered Project-related and are not further assessed. Sampling depths for sediment used in the risk assessments were 0 to 0.5 ft bgs in the off-Project Red Maple Swamp/tidal stream area and 0 to 0.5 ft bgs and 0 to 1 ft bgs in the off-Project Narraganset Bay and Beachfront area.

A list of sediment samples and a summary of the analytical sediment data evaluated in the risk assessments are presented in **Attachment A, Tables A-5a through A-5c**.

2.1.6 Surface Water

Surface water samples were collected in the off-Project Red Maple Swamp/tidal stream area in 2011 and 2014 and in the Narragansett Bay within the off-Project Narraganset Bay and Beachfront area in 2015. Surface water samples were analyzed for unfiltered (total) and filtered (dissolved) inorganics, PCBs, and VOCs, although not all samples

were analyzed for all analytes. The HHRA utilizes only the total inorganic surface water data, while the ERA utilizes both the total and dissolved inorganic data.

A list of surface water samples and a summary of the analytical surface water data evaluated in the risk assessments are presented in **Attachment A, Tables A-6a through A-6c.**

2.1.7 Soil Vapor

Soil vapor samples were collected in the on-Project Blue Beach area in 1992 and 2006 and analyzed for VOCs. Soil vapor results from samples collected from the 2006 sample event were selected for evaluation in the HHRA as being more representative of current conditions on the Project. Soil vapor results from the 1992 sampling event were not quantitatively evaluated in the HHRA because they were collected over 20 years ago and are not considered representative of current conditions.

A list of soil vapor samples and a summary of the analytical soil vapor data evaluated in the HHRA are presented in **Attachment A, Tables A-7a and A-7b**.

2.2 Data Treatment

Analytical soil, hydric soil, groundwater, porewater, sediment, surface water, and soil vapor data were validated and qualified prior to use in the risk assessments. Data evaluation and validation included a comparison of the analytical results for Site and background samples to results for corresponding blank (laboratory, field, equipment, and trip) samples. No analytical results were rejected ("R" qualified) by the evaluation. Multiple results in soil, hydric soil, groundwater, porewater, sediment, and surface water were qualified as estimated ("J" qualified). In addition, analytical results for aluminum in one background hydric soil sample, copper and manganese in 11 background sediment samples, and mercury analyzed by SEM methods in 10 sediment samples were qualified with a "B", indicating that the analyte was detected in the laboratory method blank analyzed concurrently with the sample. SEM and AVS results were not validated prior to evaluation in the risk assessments. Results with "J" or "B" qualifiers were used in the risk assessments without modification. If the value was flagged with "U" or "UJ," the result was considered a non-detect value.

For each medium/exposure area, analytical data were compiled into summary statistics for evaluation in the HHRA and ERA. Summary statistics were calculated following data treatment, as described in this section.

2.2.1 Total PAH and PCB Summations

Groups of chemicals including PAHs, low molecular weight (LMW) PAHs, high molecular weight (HMW) PAHs, PCB Aroclors, and xylenes (i.e., o-, m-, and p-xylenes) were totaled per sample prior to calculating summary statistics. These totals were calculated as the sum of individual compound concentrations; treatment of non-detects is discussed below. Total PAH sums were used only in the ERA; the HHRA evaluated PAHs as individual compounds. Ecological benchmarks are generally based on the PAH sums, and USEPA Region 4 guidance (USEPA, 2018a) specifies the use of benchmarks based on PAH sums for soil and sediment. Total PCB Aroclors and xylenes sums are used in both the HHRA and the ERA.

The PAH compounds were grouped into LMW and HMW PAH totals as follows:

PAH Compound	CAS	Molecular Weight Group
Benzo(a)pyrene	50-32-8	High
Benzo(g,h,i)perylene	191-24-2	High
Pyrene	129-00-0	High
Dibenzo(a,h)anthracene	53-70-3	High
Benzo(b)fluoranthene	205-99-2	High
Fluoranthene	206-44-0	High
Benzo(k)fluoranthene	207-08-9	High
Chrysene	218-01-9	High
Benzo(a)anthracene	56-55-3	High

PAH Compound	CAS	Molecular Weight Group
Indeno(1,2,3-cd)pyrene	193-39-5	High
Naphthalene *	91-20-3	Low
Anthracene	120-12-7	Low
Acenaphthene	83-32-9	Low
Phenanthrene	85-01-8	Low
Fluorene	86-73-7	Low
2-Methylnaphthalene	91-57-6	Low
Acenaphthylene	208-96-8	Low
1-Methylnaphthalene	90-12-0	Low

* Naphthalene results reported for the SVOC method were used in the total LMW PAH calculations.

Total PCB Aroclors were calculated as the sum of individual Aroclor compounds as follows:

PCB Aroclor	CAS
Aroclor 1260	11096-82-5
Aroclor 1254	11097-69-1
Aroclor 1242	53469-21-9
Aroclor 1221	11104-28-2
Aroclor 1232	11141-16-5
Aroclor 1248	12672-29-6
Aroclor 1016	12674-11-2
Aroclor 1262 *	37324-23-5
Aroclor 1268 *	11100-14-4

* Analysis of these PCB Aroclors were included in only one sampling event, as further discussed below.

All PCB datasets included the analysis of seven PCB Aroclors (the first 7 listed in the above table). The PCB datasets from the November 2011 sampling event, including hydric soil, porewater, sediment, and surface water samples in the off-Project Red Maple Swamp/tidal marsh area, also included analysis of Aroclor 1262 and Aroclor 1268, however, neither of these Aroclors was detected in any of the samples analyzed in any media. Therefore, Aroclor 1262 and Aroclor 1268 were not included in the PCB Aroclor analyses in following sampling events.

For data sets that include non-detect results for individual PAH or PCB Aroclors, the level of detection (LOD) was used to represent the non-detect result and the sum of concentrations was calculated using the Kaplan-Meier (KM) method, which is a non-parametric statistical method that does not require assumptions of normality (Kaplan and Meier, 1958). The KM method is recommended in USEPA ProUCL software (Version 5.1.002; USEPA, 2016) for calculating the 95% UCL on the arithmetic mean concentration for data sets with one or more censored or non-detect results (USEPA, 2015a). In the application of summing a group of related compounds such as PAHs and PCBs, the KM mean was estimated for sample datasets that included non-detects and this KM mean was then multiplied by the number of compounds (mean × n) to compute the PAH or PCB sum for that sample.

The KM mean was calculated in R Software package that implements ProUCL's KM approach (Millard SP, 2013). At least two detected individual compounds are required for the calculation of the KM mean. If a PAH or PCB dataset included non-detect results but had at least two detected individual compounds with distinct concentration results, the KM mean was estimated and rounded to the fourth decimal place.

To safeguard against a potentially biased-high estimate of the KM mean, a simple summation was calculated (i.e., sum of detected concentrations and LODs for non-detect results) to establish an upper bound of the total concentration value. If the KM summation resulted in a total concentration greater than the simple sum of detected concentrations and LODs, the simple sum was used instead.

In cases of datasets with less than two detected individual compounds, a simple sum was calculated (i.e., sum of detected concentrations and LODs for non-detected results). Simple sums were calculated for all xylene totals and a few PAH totals that had less than two detected individual compounds.

2.2.2 Treatment of Duplicate Discrete Samples

For discrete sample locations in which a field duplicate sample was also collected (e.g. parent sample and corresponding field duplicate), the combined sample results for each chemical/medium/area/depth interval combination was processed for use in the calculation of summary statistics. Parent and field duplicates were resolved as follows: 1) where both the parent sample and the duplicate are not detected, the lower of the LODs was used, 2) where both the parent sample and the duplicate are detected, the average of the detected results was used, and 3) where one of the pair is reported as not detected and the other is detected, the detected concentration was used.

2.2.3 Analyses via Multiple Methods

In some samples, naphthalene was analyzed using different methods in the same samples (e.g., SVOC and VOC methods). Naphthalene results from both SVOC and VOC methods were summarized and evaluated separately for consideration in the risk assessments. Naphthalene is an LMW PAH and was therefore included in the total LMW PAH sum calculations derived for each sample, as discussed in Section 2.2.1. Naphthalene results reported for the SVOC method were used in the total LMW PAH calculations. The total LMW PAH values are considered only in the ERA. In general, in cases where a sample evaluated in the ERA had naphthalene results from both SVOC and VOC methods (e.g., a subset of surface soil, surface hydric soil, and surface sediment samples), the SVOC result was higher. Therefore, the use of the SVOC result in the total LMW PAH calculation is not expected to underestimate associated ecological risks.

2.2.4 Summary Statistics

For each chemical detected at least once within an area/media/depth interval (i.e., surface soil, subsurface soil, etc.), the summary statistics include the minimum and maximum detected concentrations, location of maximum detected concentration, frequency of detection (FOD), and the range of detection limits calculated in accordance with USEPA Risk Assessment Guidance for Superfund (RAGS; USEPA, 1989). Additional summary statistics, including the 95% UCL concentration and the mean concentration were compiled as applicable. The UCL and mean concentrations were calculated using different methods for discrete and ISM samples, as described below.

2.2.4.1 Discrete Samples

USEPA ProUCL software (Version 5.1.002; USEPA, 2016) was used to calculate the ProUCL-recommended 95% UCL and the KM Mean concentration, as applicable for use in the evaluation of COPCs in the HHRA and/or ERA, as described in Sections 3 and 4, respectively. Where a sufficient sample size or FOD was not available for ProUCL to calculate a reliable statistic, in which case the program provided a warning or other message indicating a UCL is not recommended, the maximum detected concentration was utilized for evaluation in the HHRA and ERA, as indicated in Sections 3 and 4, respectively. Similarly, where a KM mean was not calculated by ProUCL (i.e., datasets with 100% detected results), the mean of the detected results was used. The ProUCL inputs and outputs associated with the HHRA and ERA are presented separately in **Attachment B**.

2.2.4.2 ISM Samples

Results for PCBs from triplicate ISM soil samples collected from each of the three SUs within the on-Project Blue Beach area were used to calculate a 95% UCL concentration per depth interval (i.e., surface soil and subsurface soil) for evaluation in the HHRA and/or ERA. The SU-specific 95% UCL concentrations were calculated based on triplicate ISM samples within each SU. The SU-specific 95% UCLs were treated as individual results for calculation of the FOD and the maximum detected concentration used in the preliminary COPC screening steps of the HHRA and ERA, as discussed in Sections 3 and 4, respectively. The SU-specific 95% UCLs were also used to calculate a weighted mean UCL concentration for the on-Project Blue Beach area, by weighting the SU-specific UCLs based on the size (i.e., surface area) of the SU. This additional refinement was conducted to address uncertainty associated with the variability in the triplicate sample results and to ensure that a conservative estimate of a mean concentration representative of the on-Project Blue Beach exposure area was obtained, without inappropriately biasing the exposure point concentration toward a specific SU.

Due to the nature of the ISM sampling which results in a smaller sample size per SU than what is recommended for the appropriate use of USEPA's ProUCL Software (USEPA, 2016), the ISM calculator provided in the Interstate Technology Regulatory Council ISM guidance (ITRC, 2012) was used to calculate the SU-specific 95% UCLs. The ISM calculator is designed to calculate UCLs for data sets with few samples based on both the Chebyshev and Student's t methods (ITRC, 2012). If the coefficient of variation (CV), calculated as the standard deviation divided by the arithmetic mean concentration, is greater than 35% (indicating high variability), the Chebychev UCL is

recommended. If the CV is less than 35% (indicating low variability), the Student's t UCL is recommended (ITRC, 2012). The CVs associated with all of the on-Project Blue Beach ISM soil data sets were less than 35%, therefore, the Student's t UCL was the selected UCL for all data sets. UCLs calculated based on small sample sizes may be greater than the maximum detected concentration, which was the case for this project. Consistent with ISM guidance (ITRC, 2012), the UCL was used, even if greater than the maximum detected concentration.

The SU-specific 95% UCL calculations performed using the ITRC ISM Calculator and the weighted mean UCLs for the on-Project Blue Beach exposure area are provided in **Attachment C**.

2.3 Background Evaluation

Representative soil, hydric soil, and sediment background chemistry data (discrete samples) for metals and PAHs were collected for comparison to Site-specific data within the risk assessments. A list of the soil, hydric soil, and sediment background samples and the associated analytical data summary tables are presented by media in **Attachment A.**

Representative background soil, hydric soil, and sediment were collected in May 2020 at Rome Point State Park in North Kingstown, Rhode Island, and in the upstream portion of the off-Project Red Maple Swamp/tidal stream area (between Circuit Drive and outfall 025). Both areas are deviations from background sampling locations identified in the RAWP provided in the SAP (Mabbett, 2019), as described in the Draft Trip Report for the Comprehensive Remedial Investigation Former Blue Beach Disposal Area FUDS (Mabbett, 2020), because permission was not granted for access to previously identified background areas. Rome Point State Park is located on Narragansett Bay with similar shoreline features to the former Blue Beach Disposal Area but has not been impacted by past military operations. The portion of the tidal stream where the background sediment samples were collected is upgradient and outside of the Site-related influence.

The available background data were compiled and compared with Site-specific data to distinguish Site-related impacts from non-Site-related background conditions (naturally occurring or anthropogenic). The background evaluation consisted of a tiered process and was conducted as part of the COPC selection process to focus the HHRA and ERA on Site-related COPCs, in accordance with the Tri-Service Position Paper on Background Levels in Risk Assessment (USACE, 2011), as follows:

- The background datasets were evaluated for the presence of outliers using the default outlier test (Dixon's Test) in USEPA's ProUCL software (USEPA, 2016) prior to conducting the following tiers of background evaluation. These statistical tests can identify "extreme" values in the background datasets; however, extreme values were not identified as outliers unless additional justification was evident. Datasets with background samples identified as extreme values were further evaluated by conducting outlier tests with data transformations. If a sample was identified as an extreme value and the same sample was identified for other COPCs in the same chemical group, the value was removed from the dataset prior to the background threshold values (BTV) calculation, the two-sample hypothesis test, and the geochemical analysis.
- Derivation of BTVs - Medium-specific BTVs were derived for chemicals identified as preliminary COPCs in the HHRA and/or ERA. The processes for selecting preliminary COPCs for human health and ecological receptors are described in detail in Sections 3 (HHRA) and 4 (ERA), respectively.
- Hypothesis testing - For each medium and chemical for which preliminary COPCs were detected at concentrations above BTVs, hypothesis testing for centrality was conducted to compare the mean background concentration with Site-related concentrations.
- Geochemical analysis - For metals identified as preliminary COPCs that are not eliminated based on a comparison to BTVs or hypothesis testing, a geochemical analysis was conducted to distinguish whether metals concentrations are either present due to Site/anthropogenic activities or are naturally occurring. The premise of conducting a geochemical evaluation is to identify metals concentrations that are originally derived from minerals (rocks) that, when exposed, break down and result in the release of metals. The metals will form new minerals (secondary minerals) via new processes, including absorption and precipitation. The primary metals that adsorb to other metals are aluminum (Al), iron (Fe), and manganese (Mn) (i.e., Al as mostly clays, Fe and Mn as primarily oxyhydroxides). If the metals detected at the Site are naturally occurring, a relationship can be observed via regression. A regression graph is utilized, plotting the concentrations of major/reference metals (Al, Fe, and Mn) on the x-axis against other metals on the y-axis. If the metals form a good regression (line) from the

lower left corner to upper right corner of the graph, then these metals are most likely to be naturally occurring. If there is not a good regression, their presence is most likely is due to Site or other anthropogenic activities.

For media/chemicals for which requirements for conducting a statistical evaluation are not met (e.g., Site or background dataset consist of mainly non-detects), a qualitative/graphical comparison (using box plots or other plots, as appropriate) was performed.

The results of the background evaluation were used in the HHRA and ERA as discussed in Sections 3 and 4, respectively. Chemicals identified as being detected at concentrations consistent with background (i.e., non-Site related COPCs) were not be further quantitatively evaluated in the HHRA and ERA.

The background evaluation is provided in **Attachment D** and overall results are summarized below.

Outlier values were identified for three samples: a surface soil sample, a hydric surface soil sample, and a hydric subsurface soil sample, and extreme values determined to be outliers for these samples were removed from the datasets prior to BTV calculation, two-sample hypothesis test, and the geochemical analysis.

Media	COPCs with Outlier Values Removed from Datasets
Surface soil (SB-412)	Anthracene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, pyrene, total HMW PAHs, and total PAHs
Hydric surface soil (SSH-313)	Arsenic, chromium, cobalt, copper, iron, and manganese
Hydric subsurface soil (SSH-313)	Arsenic, cobalt, and iron

BTVs were calculated for preliminary COPCs and compared to Site concentrations in the risk assessments. Any preliminary COPC for which Site concentrations are less than the BTVs were eliminated from the risk assessments. These comparisons are discussed separately within the HHRA (Section 3) and the ERA (Section 4).

A two-sample hypothesis test was conducted for each COPC retained following the comparison of BTVs to Site concentrations in the risk assessments. The two-sample hypothesis test compared the central tendency (i.e., the mean or median) of the Site and background datasets and identify the COPCs for which Site and background concentrations are consistent. The following table presents the COPCs for which the central tendency (i.e., median or mean concentrations) of Site datasets are less than or equal to background datasets and were not retained for further evaluation in the risk assessments. COPCs were eliminated for all exposure media and areas with the exception of hydric subsurface soil for which no COPCs were eliminated based on the two-sample hypothesis test results.

Media	COPCs Not Retained Based on Two-Sample Hypothesis Tests
Surface Soil	**On-Project Blue Beach Area**: chromium, cobalt, manganese, mercury, nickel, silver, anthracene, benzo(a)pyrene, total HMW PAHs, total PAHs; **Off-Project Red Maple Swamp / Tidal Stream Area:** chromium, lead, zinc, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, pyrene, total HMW PAHs, total PAHs.
Subsurface Soil	**On-Project Blue Beach Area:** arsenic, copper, lead, manganese
Sediment	**Off-Project Red Maple Swamp / Tidal Stream Area:** aluminum, arsenic, barium, beryllium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, vanadium, and fluorene; **Off-Project Narragansett Bay / Beachfront Area:** aluminum, arsenic.
Hydric Surface Soil	**Off-Project Red Maple Swamp / Tidal Stream Area:** manganese, anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, pyrene, total HMW PAHs

The last step in the background evaluation was the geochemical evaluation, which was performed for metals retained as COPCs based on the results of the two-sample hypothesis tests which concluded Site concentrations were greater

than background. Correlations between the reference elements and COPCs were examined using scatterplots and pairwise correlations. Significant, positive correlations between reference elements and COPCs in background and Site indicated the COPC is naturally occurring and eliminated from the HHRA and ERA. The following COPCs were eliminated from further evaluation in the risk assessments on the basis of the geochemical evaluation:

Media	**COPCs Not Retained Based on Two-Sample Hypothesis Tests**
Sediment	**Off-Project Red Maple Swamp / Tidal Stream Area:** cadmium and zinc
Hydric Surface Soil	**Off-Project Red Maple Swamp / Tidal Stream Area:** aluminum, chromium, cobalt, iron, manganese, vanadium, and zinc
Hydric Subsurface Soil	**Off-Project Red Maple Swamp / Tidal Stream Area:** arsenic, cobalt, iron, and vanadium

3. Human Health Risk Assessment

The HHRA was conducted to evaluate whether exposure to COPCs attributable to past operations at the former Blue Beach Disposal Area may pose a risk and/or hazard to human health above USEPA target levels. The evaluation included performing a quantitative estimation of potential cancer risk and noncancer hazard to current and potential future human receptors that may come into contact with Site-related chemicals in soil, hydric soil, groundwater, sediment, surface water, and soil vapor within the on-Project Blue Beach area and off-Project areas (i.e., Off-Project Red Maple Swamp/tidal stream area and off-Project Narragansett Bay and Beachfront area), as applicable. **Table 3-1** presents a summary of the exposure areas, human receptors, and current and potential future exposure routes qualitatively and/or quantitatively evaluated in the HHRA. The HHRA was conducted in accordance with USEPA CERCLA risk assessment guidance (USEPA, 1989, 2004, 2005a, and 2009).

The HHRA was conducted in accordance with the RAWP provided in the SAP (Mabbett, 2019) with certain updates to reflect the most currently available USEPA HHRA guidance. USEPA's four step HHRA paradigm (USEPA, 1989) was followed to conduct the HHRA, as follows:

- Data Evaluation and Hazard Identification
- Exposure Assessment
- Toxicity Assessment
- Risk Characterization

Each of the tiers of evaluation is discussed in further detail in the following subsections.

Tables are numbered based on the Risk Assessment Guidance for Superfund (RAGS) Part D (USEPA 2001) numbering system, as noted in the following table. Table numbers also include the report section number before the RAGS Part D table number, and a final number where multiple tables are included (e.g., the Table 2s are numbered Table 3-2-1 to 3-2-10, as there are 10 of them).

Table #	RAGS Part D Table Title
Table 1	Selection of Exposure Pathways (HHRA)
Table 2	Occurrence, Distribution, and Selection of Chemicals of Potential Concern
Table 3	Exposure Point Concentration Selection
Table 4	Values Used for Daily Intake Calculations
Table 5	Non-Cancer Toxicity Data
Table 6	Cancer Toxicity Data
Table 7	Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Table 9	Summary of Receptor Risks and Hazards for COPCs
Table 10	Risk Summary

Note: RAGS Part D Table 8 (Calculation of Radiation Cancer Risks) is not applicable to this HHRA.

3.1 Data Evaluation/Hazard Identification

The data evaluation and hazard identification step involve identification and summarization of Site data appropriate for use in the HHRA, and the selection of COPCs for quantitative evaluation in the HHRA. Analytical data was grouped for evaluation in the HHRA, as discussed in Section 2.1.

3.1.1 Selection of Chemicals of Potential Concern

COPCs are a subset of the complete list of chemicals detected in Project media that are carried through the quantitative risk assessment process. The HHRA COPC selection process may consider low FOD, low toxicity and low concentration, consistency with Site-specific background, essential nutrient status, and whether the chemical is

likely to be present due to laboratory contamination. For this HHRA, Site-related COPCs were established per exposure area, medium, and depth interval (as appropriate) as described in the following sub-sections.

3.1.1.1 Frequency of Detection and Essential Nutrients

Essential nutrients, including magnesium, calcium, potassium, and sodium were not selected as COPCs for further evaluation in the HHRA, consistent with USEPA guidance (USEPA, 1989). Chemicals were not eliminated as COPCs on the basis of low FOD alone. However, a discussion of COPCs with a low FOD is provided in the risk characterization.

3.1.1.2 Comparison to Human-Health Screening Levels

Preliminary COPCs were identified based on a comparison of the maximum detected concentrations of each chemical detected in discrete samples per media/area/depth interval (as applicable) to human health screening levels (or regulatory values as available). For PCBs analyzed from ISM soil samples, the SU-specific 95% were used for the preliminary COPC evaluation because they are greater than the maximum detected concentrations, as discussed in Section 2.2.4.2. Chemicals detected at concentrations above the screening levels were identified as preliminary COPCs for further evaluation in comparison with background, as discussed in the following section. Chemicals either not detected in a particular medium or detected at concentrations below the screening levels and regulatory values were not identified as COPCs for the associated medium/area and were not evaluated further in the HHRA. For chemicals lacking a screening level, a conservative surrogate chemical was identified, if available, and its screening level selected for use in the COPC selection. A chemical was eliminated as a COPC if there are no associated toxicity values available with which quantitative evaluation in the HHRA may be performed, an appropriate surrogate cannot be identified, and the investigation provides no other evidence of an apparent source of unacceptable risk.

Screening levels used to select preliminary human health COPCs are discussed by media below.

Soil and Hydric Soil

The USEPA Regional Screening Levels (RSLs) (USEPA, 2020a) based on a target ELCR of 1×10^{-6} and a target hazard quotient (HQ) of 0.1 were used in the HHRA to select COPCs in soil and hydric soil. The RSLs based on a target HQ of 0.1 were used to account for potential cumulative effects of multiple constituents on the same target organ. The residential soil RSLs were used in the selection of preliminary COPCs for evaluation of all receptors. The residential soil RSLs are based on USEPA's default residential exposure frequency of 350 days/year and exposure duration of 26 years. Use of the residential soil RSLs is conservative for non-residential scenarios because the exposure frequency and duration associated with non-residential exposure scenarios are less than those for a residential scenario.

The industrial soil RSLs were used for comparative purposes only and were not used in the selection of preliminary COPCs. The industrial soil RSLs are based on the default 250 days/year exposure frequency and 25-year default exposure duration for workers.

A comparison to screening levels protective of the soil to groundwater pathway was not included in this HHRA. Analytical groundwater data are available and were evaluated directly.

Tables 3-2.1 and 3-2.2 present the preliminary COPC selection for surface soil and subsurface soil, respectively. **Tables 3-2.3 and 3-2.4** present the preliminary COPC selection for hydric surface soil and hydric subsurface soil, respectively.

Groundwater

As discussed in Section 2.1.3, groundwater data were summarized in two ways for evaluation in the HHRA, (1) groundwater collected from all depths, and (2) shallow groundwater, defined as groundwater samples collected less than or equal to 15 ft bgs. The following screening levels were used for both groundwater datasets:

- USEPA tap water RSLs (USEPA, 2020a) based on a target ELCR of 1×10^{-6} and a target HQ of 0.1 (to account for potential cumulative effects of multiple chemicals on the same target organ).
- USEPA Maximum Contaminant Levels (MCLs) (USEPA, 2018b).

Chemicals detected at a concentration greater than the RSL or MCL were selected as preliminary groundwater COPCs. These levels are protective of a residential drinking water exposure scenario. Therefore, use of these

screening levels is conservative for selecting COPCs for non-drinking water exposure scenarios (such as incidental ingestion by a construction worker). **Tables 3-2.5 and 3-2.6** present the preliminary COPC selection for groundwater and shallow groundwater, respectively.

Shallow groundwater data were also evaluated in comparison to USEPA Vapor Intrusion Screening Levels (VISLs) for groundwater based on a target ELCR of 1×10^{-6} and a target HQ of 0.1 (USEPA, 2020b) as a preliminary screening evaluation of the potential vapor intrusion pathway. However, soil vapor data were the primary dataset used for selection of COPCs for evaluation of the potential vapor intrusion pathway. VISLs associated with a residential and industrial worker exposure scenario were used for comparison. **Table 3-2.7** presents the comparison of shallow groundwater data to VISLs.

Sediment

Published human health screening levels are not available for sediment. Therefore, residential soil RSLs were used for selecting preliminary COPCs in sediment. The use of residential soil RSLs for evaluation of sediment is very conservative due to the lower exposure frequency for sediment as compared to soil. **Table 3-2.8** presents the preliminary COPC selection for sediment.

Surface Water

The following surface water screening levels were used in the HHRA:

- USEPA National Recommended Ambient Water Quality Criteria (AWQC) for human health consumption of water and organisms (USEPA, 2020c).
- USEPA tap water RSLs based on a target ELCR of 1×10^{-6} and a target HQ of 0.1 (USEPA, 2020a). The tap water RSLs are protective of a residential drinking water exposure scenario. Therefore, use of these screening levels is overly conservative for selecting surface water COPCs.

Chemicals detected at a concentration greater than the USEPA AWQC (or RSL if an AWQC is not available) were selected as preliminary surface water COPCs. **Table 3-2.9** presents the preliminary COPC selection for surface water.

Soil Vapor

The USEPA VISLs for soil vapor based on a target ELCR of 1×10^{-6} and a target HQ of 0.1 (to account for potential cumulative effects of multiple chemicals on the same target organ) (USEPA, 2020b) were used to select soil vapor COPCs for further evaluation of the potential vapor intrusion pathway. The residential VISLs were used in the selection of preliminary soil vapor COPCs for evaluation of all receptors. The residential VISLs are based on USEPA's default residential exposure frequency of 350 days per year and exposure duration of 26 years. Use of the residential VISLs is conservative for a non-residential scenario because the exposure frequency and duration associated with a non-residential exposure scenario is less than that for a residential scenario.

The industrial VISLs were used for comparative purposes only. The industrial VISLs are based on a USEPA default exposure frequency of 250 days per year and exposure duration of 25 years for an indoor worker scenario. **Table 3-2.10** presents the preliminary COPC selection for soil vapor.

3.1.1.3 Surrogate Screening Levels

For certain analytes lacking a chemical-specific screening level, a conservative surrogate chemical was selected and its screening level was used in the preliminary COPC selection. Specific instances where surrogate assignments were made are identified in footnotes in **Tables 3-2.1 through Table 3-2.10**.

3.1.1.4 Comparison to Background Levels

Preliminary COPCs identified in soil, hydric soil and sediment based on the comparison to human health screening levels were further evaluated in conjunction with background data, as available. The background evaluation was conducted as described in Section 2.3. Chemicals within a medium/area/depth interval that are (1) not detected at a concentration above the associated BTV, (2) for which the hypothesis testing for centrality concludes that Site concentrations are consistent with background, or (3) the geochemical analysis concludes that Site concentrations are consistent with background, were not identified as Site-related COPCs and were excluded from further quantitative evaluation in the HHRA. Preliminary COPCs that were not identified as being consistent with background were identified as Site-related COPCs and were further quantitatively evaluated in the HHRA.

Attachment D presents the background evaluation, including outlier evaluation, derivation of BTVs, hypothesis testing and geochemical analysis. The comparison of the surface soil, subsurface soil, hydric surface soil, hydric subsurface soil, and sediment datasets to the associated BTVs is provided in the preliminary COPC selection tables; **Tables 3-2.1, 3-2.2, 3-2.3, 3-2.4, and 3-2.8**, respectively.

3.1.2 COPC Selection Results

Table 3-2.11 summarizes the preliminary COPCs identified per media/depth interval/area based on the comparison of the maximum detected concentration (or maximum SU-specific 95% UCL concentration for ISM soil samples) to human health screening levels. For soil, hydric soil, and sediment COPCs with an associated medium-specific dataset, it also summarizes the results of each tier of background evaluation and whether the preliminary COPC was retained or excluded from being a Site-related COPC based on the associated tier. **Table 3.2.11** presents whether each preliminary COPC was retained as a Site-related COPC for further evaluation in the HHRA.

A summary of the Site-related COPCs identified for further evaluation in the HHRA are indicated with an “X” in the following tables provided by medium and depth interval (as applicable):

Soil				
Exposure Point	CAS Number	COPC	Surface Soil	Subsurface Soil
On-Project Blue Beach Area		**Inorganics**		
	7440-36-0	Antimony	X	X
	7440-43-9	Cadmium	X	X
		PCBs		
	Tot-PCB-ARO	Total PCB Aroclors	X	X
		SVOCs		
	53-70-3	Dibenzo(a,h)Anthracene	X	
		VOCs		
	95-63-6	1,2,4-Trimethylbenzene		X
	100-41-4	Ethylbenzene		X
	Tot-Xylenes	Total Xylenes		X
	79-01-6	Trichloroethylene		X

CAS – Chemical Abstracts Service.

*Naphthalene was identified as a COPC based on results from SVOC and VOC analytical methods.

Soil (Continued)				
Exposure Point	CAS Number	COPC	Surface Soil	Subsurface Soil
Off-Project Red Maple Swamp / Tidal Stream Area		**Inorganics**		
	7440-38-2	Arsenic		X
		SVOCs		**X**
	50-32-8	Benzo(a)Pyrene		X
	91-20-3	Naphthalene*		X
		PCBs		
	Tot-PCB-ARO	Total PCB Aroclors	X	
		VOCs		
	100-41-4	Ethylbenzene		X
	91-20-3	Naphthalene*		X

*Naphthalene was identified as a COPC based on results analyzed by SVOC and VOC analytical methods.

Hydric Soil				
Exposure Point	CAS Number	COPC	Surface Hydric Soil	Subsurface Hydric Soil
Off-Project Red Maple Swamp / Tidal Stream Area		**Inorganics**		
	7440-38-2	Arsenic	X	
	7440-28-0	Thallium	X	X
		PCBs		
	Tot-PCB-ARO	Total PCB Aroclors	X	X
		SVOCs		
	50-32-8	Benzo(a)Pyrene	X	
	205-99-2	Benzo(b)fluoranthene	X	
	53-70-3	Dibenzo(a,h)Anthracene	X	
	193-39-5	Indeno(1,2,3-cd)Pyrene	X	

Groundwater				
Exposure Point	CAS Number	COPC	All Depths	Shallow
On-Project Blue Beach Area		**Inorganics**		
	7440-36-0	Antimony	X	X
	7440-38-2	Arsenic	X	X
	7440-39-3	Barium	X	
	7440-43-9	Cadmium	X	X
	7440-47-3	Chromium	X	
	7440-48-4	Cobalt	X	X
	7439-89-6	Iron	X	X
	7439-92-1	Lead	X	
	7439-96-5	Manganese	X	X
		SVOCs		
	90-12-0	1-Methylnaphthalene	X	X
	91-57-6	2-Methylnaphthalene	X	X
	56-55-3	Benzo(a)anthracene	X	X
	50-32-8	Benzo(a)Pyrene	X	X
	205-99-2	Benzo(b)fluoranthene	X	X
	91-20-3	Naphthalene*	X	X
		VOCs		
	79-34-5	1,1,2,2-Tetrachloroethane	X	
	79-00-5	1,1,2-Trichloroethane	X	
	75-34-3	1,1-Dichloroethane	X	
	95-63-6	1,2,4-Trimethylbenzene	X	X
	78-87-5	1,2-Dichloropropane	X	X
	67-66-3	Chloroform	X	
	156-59-2	cis-1,2-Dichloroethene	X	X
	100-41-4	Ethylbenzene	X	X
	91-20-3	Naphthalene*	X	
	127-18-4	Tetrachloroethene	X	
	Tot-Xylenes	Total Xylenes	X	X
	79-01-6	Trichloroethylene	X	X
	75-01-4	Vinyl Chloride	X	

*Naphthalene was identified as a COPC based on results analyzed by SVOC and VOC analytical methods.

Sediment		
Exposure Point	CAS Number	COPC
Off-Project Red Maple Swamp / Tidal Stream Area		**PCBs**
	Tot-PCB-ARO	Total PCB Aroclors
Off-Project Narragansett Bay and Beachfront area	--	None identified

Surface Water		
Exposure Point	CAS Number	COPC
Off-Project Red Maple Swamp / Tidal Stream Area		**VOCs**
	87-61-6	1,2,3-Trichlorobenzene
	91-20-3	Naphthalene
Off-Project Narragansett Bay and Beachfront area	--	None identified

Soil Vapor		
Exposure Point	CAS Number	COPC
On-Project Blue Beach Area		**VOCs**
	71-43-2	Benzene
	142-82-5	n-Heptane
	75-01-4	Vinyl Chloride

No Site-related COPCs were identified in the Off-Project Narragansett Bay and Beachfront area; therefore, this area was not further quantitatively evaluated in the HHRA.

3.2 Exposure Assessment

The purpose of the exposure assessment is the quantification of the extent, frequency, and duration of actual or potential exposure to COPCs by pathways relevant to the on-Project and off-Project exposure areas and activities of the potential receptors. As part of the exposure assessment, current and potential future exposure pathways were determined through the identified populations which may potentially be exposed to COPCs identified within the following exposure areas:

- On-Project Blue Beach area – within the Former Blue Beach Disposal Area FUDS
- Off-Project Red Maple Swamp/tidal stream area – within the tidal marsh referred to as “Red Maple Swamp” and the adjacent public walking path from Circuit Drive to Blue Beach

An exposure pathway describes the course a chemical follows while moving through environmental media to the receptor. An exposure pathway may consist of a mechanism of release of chemicals to an environmental medium (e.g., soil), an exposure route (e.g., ingestion), and a receptor (e.g., construction worker). An exposure pathway is considered complete when contact by a receptor with impacted media may occur under current site conditions or in the future. USEPA (1989, 1991) guidance requires that plausible exposures under both current and future land use scenarios be evaluated in an HHRA. A summary of the exposure areas, human receptors, and current and potential future exposure routes qualitatively and/or quantitatively evaluated in the HHRA is presented on **Table 3-1**. No Site-related sediment or surface water COPCs were identified in the Off-Project Narragansett Bay and Beachfront area; therefore, this area was not further quantitatively evaluated in the HHRA.

3.2.1 Human Health Conceptual Site Model

The Quonset Business Park Master Land Use and Development Plan, adopted October 2008, identifies the Site as being located in an area designated for light industrial use. The majority of the Project area is currently used for industrial/manufacturing purposes. The Project area is bordered to the north by the former Kiefer Park Tank Farm,

which is currently undeveloped property. South of the Project area is Blue Beach bordering the Narragansett Bay. The beach is currently used recreationally. A paved walking path runs along the west side of the Project area extending from Circuit Drive to Blue Beach (Narragansett Bay Beachfront). The walking path is bordered by trees and vegetation. To the west of the walking path is a salt marsh and tidal creek, referred to as Red Maple Swamp, which is accessible by humans. Surface water in this area is very shallow; therefore, potential exposure may occur via a limited wading scenario. To the west of the off-Project Red Maple Swamp/tidal stream area is a residential area.

There are currently no residential receptors within the on-Project Blue Beach area and residential use is not a reasonably anticipated future use of the Site. The area is not zoned for residential use, and an ELUR barring residential use of the parcel has been recorded. Groundwater within the on-Project Blue Beach area is classified by the Rhode Island Department of Environmental Management (RIDEM) as 'GB', may not be suitable for drinking without treatment. Based on its proximity to Narragansett Bay and wetlands, groundwater is likely to be brackish, and the extraction of groundwater to serve as a water source (or to treat) would likely draw additional saline water into the system and would, therefore, not be implementable. Additionally, an ELUR recorded on the deed prohibits potable use of groundwater from the parcel. However, the HHRA conservatively evaluated a future unlimited use/unrestricted exposure (UU/UE) scenario for informational purposes and for use in the forthcoming Feasibility Study (FS), if needed. In the unlikely event that the Project area is converted to residential use in the future, it is not reasonable to expect that the residents would use groundwater as a potable water source. A remedial response will not necessarily be taken based on the results of the future UU/UE scenario given it is not a reasonably anticipated future use for the Site, per the DoD Defense Environmental Restoration Program (DERP) Management Manual (DoD, 2012), which states "The DoD Component shall consider current and reasonably anticipated future land uses in risk assessments. The DoD Component does not have to assume that the reasonably anticipated future land use is residential."

The buildings currently located within the on-Project Blue Beach area are used for industrial/manufacturing purposes and have vapor barriers installed. Therefore, the vapor intrusion pathway is considered incomplete under a current use scenario. Additionally, Hayward Pool Products, which is currently located on the on-Project Blue Beach area, has previously submitted a written statement to RIDEM that any future buildings constructed on its parcels would include a vapor barrier to prevent vapor intrusion. However, the HHRA performed a screening level evaluation of the potential vapor intrusion pathway for a future on-Project Blue Beach indoor worker to provide information for determining whether a vapor intrusion mitigation system is recommended for future buildings constructed on the on-Project Blue Beach. A screening level vapor intrusion evaluation was also assessed for a hypothetical future on-Project Blue Beach residential scenario as part of the UU/UE scenario evaluation.

Although there are no known plans for redevelopment on the on-Project Blue Beach area, it is conservatively assumed that limited construction or utility-related activities may occur in this area.

Groundwater in the off-Project Red Maple Swamp is classified by RIDEM as 'GA', known or presumed to be suitable for drinking water use without treatment. However, this area is a salt marsh and is therefore highly unlikely to be redeveloped under a future use scenario. Additionally, QDC (the parcel owner) is currently in the process of recording an ELUR on the deed that will restrict groundwater use for potable purposes. As a result, water supply wells are not likely to be constructed and construction/utility work is also not considered to occur in this area. Therefore, there are no complete exposure pathways in which humans are likely to contact groundwater in this area. The off-Project residential area located to the west of the off-Project Red Maple Swamp/tidal marsh area is currently on a municipal water supply. Groundwater flow patterns indicate that migration of on-Project groundwater to the off-Project Residential area is unlikely. Therefore, there are no complete exposure pathways associated with an off-Project Resident.

The reasonably anticipated current and future receptors and exposure pathways evaluated in the HHRA based on current and potential future land use are discussed in the following sections. The quantitative exposure assumptions used to evaluate these receptors in the HHRA were selected to represent a reasonable maximum exposure (RME) scenario in accordance with USEPA guidance (USEPA, 1989, 2002a, 2004, 2011 and 2014a) and utilizing professional judgement. **Tables 3-4.1 through 3-4.8** present the medium-specific exposure assumptions per receptor and exposure route.

3.2.2 Current/Future Use Scenarios

The HHRA addresses current and future potential exposure scenarios. The current scenario timeframe represents exposure to existing Site conditions (i.e., no land redevelopment). With the exception of the construction/utility worker scenario, which assumes intrusive soil work occurs, the current/future use scenarios only involve exposure to surface soil. For the non-intrusive soil scenarios, subsurface soil (greater than 1 ft bgs) would not be disturbed unless future land redevelopment occurs. The future evaluation for these scenarios, including exposure to subsurface soil, is discussed in Section 3.2.3.

Current/Future Construction/Utility Worker - A current/future construction/utility worker was evaluated in the HHRA for the following exposure pathways within the on-Project Blue Beach area:

- Exposure to surface and subsurface soil through incidental ingestion, dermal contact and inhalation of airborne particles and volatiles in outdoor air; and
- Exposure to shallow groundwater via incidental ingestion, dermal contact, and inhalation of volatiles from an excavation trench.

The construction/utility worker is assumed to be involved in a construction project 40 days per year for 1 year. It is conservatively assumed for purposes of the HHRA that a construction/utility worker may be exposed to on-Project soil and groundwater for 10 hours per day.

Current/Future Outdoor Worker - A current/future outdoor worker was evaluated in the HHRA for exposure to surface soil in the on-Project Blue Beach area through incidental ingestion and dermal contact and inhalation of airborne particles and volatiles in outdoor air. The outdoor worker is assumed to be a full-time worker and utilizes USEPA-recommended default exposure inputs.

Current/Future Trespasser – An adolescent trespasser (age 7 to <16 years) was evaluated in the HHRA for exposure to surface soil in the on-Project Blue Beach area through incidental ingestion, dermal contact; and inhalation of airborne particles and volatiles in outdoor air. It was assumed, based on professional judgment, that trespassers may contact soil within the on-Project Blue Beach area for 26 days per year (i.e., one day per week for the warmer 6 months of the year).

Current/Future Recreational User – A recreational user (adult/child) was evaluated in the HHRA for the following exposure pathways within the off-Project Red Maple Swamp/tidal stream area:

- Exposure to surface soil through incidental ingestion, dermal contact, and inhalation of airborne particles and volatiles in outdoor air; and
- Exposure to hydric surface soil, sediment, and surface water through incidental ingestion and dermal contact under a limited wading scenario.

No Site-related COPCs were identified in the off-Project Narragansett Bay and Beachfront area. Therefore, this area is not further evaluated in the HHRA.

3.2.3 Future Use Scenarios

The future use scenarios include those exposure scenarios that are not currently applicable, but that may reasonably occur in the future. This scenario also conservatively assumes that exposure to subsurface soil may occur for current/future receptors under a hypothetical future land use scenario in which subsurface soils are brought to the surface and made available for contact.

Future Outdoor Worker - A future outdoor worker was evaluated in the HHRA for exposure to subsurface soil in the on-Project Blue Beach area through incidental ingestion, dermal contact, and inhalation of airborne particles and volatiles in outdoor air. The outdoor worker is assumed to be a full-time worker and utilizes USEPA-recommended default exposure inputs.

Future Trespasser – An adolescent trespasser (age 7 to <16 years) was evaluated in the HHRA for exposure to subsurface soil in the on-Project Blue Beach area through incidental ingestion, dermal contact, and inhalation of airborne particles and volatiles in outdoor air. It was assumed, based on professional judgment, that trespassers may

contact soil within the on-Project Blue Beach area for 26 days per year (i.e., one day per week for the warmer 6 months of the year).

Future Recreational User – A recreational user (adult/child) was evaluated in the HHRA for the following exposure pathways within the off-Project Red Maple Swamp/tidal stream area:

- Exposure to subsurface soil through incidental ingestion, dermal contact, and inhalation of airborne particles and volatiles in outdoor air; and
- Exposure to hydric surface soil, sediment, and surface water through incidental ingestion and dermal contact under a limited wading scenario. Redevelopment activities are not considered to occur in this area; therefore, hydric subsurface soil is not likely to be available for exposure by recreational users. Hydric subsurface soil was evaluated in the HHRA through the COPC selection and EPC calculation steps for informational purposes only.

It was assumed, based on professional judgment, that recreational users may contact soil, hydric soil, sediment, and surface water within the off-Project Red Maple Swamp/tidal stream area for 26 days per year (i.e., one day per week for the warmer 6 months of the year) and that exposure to surface water occurs for 1 hour per day. USEPA-recommended default inputs for a residential adult/child soil exposure scenario were used for the majority of the remaining exposure parameters. The sediment/hydric soil ingestion rate was assumed to be 10% of the USEPA-recommended default soil ingestion rate for a residential scenario.

No Site-related COPCs were identified in the off-Project Narragansett Bay and Beachfront area. Therefore, this area is not further evaluated in the HHRA.

Future Indoor Worker – A future indoor worker was evaluated in the HHRA for exposure to soil vapor in the on-Project Blue Beach area from inhalation of volatiles in indoor air via the vapor intrusion pathway under a future use scenario in which additional industrial buildings would be constructed in the on-Project Blue Beach area without a vapor mitigation system (i.e., vapor barrier). This scenario is not a likely future use scenario because Haywood Pool Products, which is currently located on the Project area, has previously submitted a written statement to RIDEM that any future buildings constructed on its parcels would include a vapor barrier to prevent vapor intrusion. However, this scenario was evaluated in the HHRA for informational purposes.

Hypothetical Future Resident (Adult/Child) – A hypothetical future resident (adult/child) was conservatively evaluated in the HHRA to represent a UU/UE scenario. Although this is not a reasonably anticipated future use of the Site, it was evaluated for informational purposes only. A hypothetical future resident was evaluated for the following exposure pathways in the on-Project Blue Beach area:

- Exposure to surface and subsurface soil through incidental ingestion, dermal contact, and inhalation of airborne particles (i.e., fugitive dust) and volatiles in outdoor air;
- Inhalation of volatiles in soil vapor via the vapor intrusion pathway; and
- Exposure to groundwater via ingestion of drinking water, and dermal contact and inhalation of volatiles during bathing/showering.

The hypothetical future residential scenario was evaluated using USEPA-recommended default exposure inputs.

3.2.4 Calculation of Dose

The purpose of the exposure assessment is estimate the magnitude, frequency, duration, and routes of current and reasonably anticipated future human exposure to COPCs associated with the Site. USEPA guidance documents used in this exposure assessment include the RAGS, Part A (USEPA, 1989); Exposure Factors Handbook (USEPA, 2011); Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (USEPA, 2002a); RAGS Part E (Supplemental Guidance for Dermal Risk Assessment) (USEPA, 2004); and Supplemental Guidance: Update of Standard Default Exposure Factors (USEPA, 2014a).

Equations are presented for the calculation of chronic daily intake values for the ingestion, dermal contact, and inhalation pathways of exposure. The equations are used for calculating a lifetime average daily dose (LADD) (oral/dermal) or lifetime average daily exposure (LADE) (inhalation) relevant to cancer risk (i.e., cancer intake) or for calculating an average daily dose (ADD) (oral/dermal) or average daily exposure (ADE) (inhalation) relevant to

noncancer hazard (i.e., noncancer intake). The medium-specific equations used for the calculation of carcinogenic and noncarcinogenic intakes of the COPCs are presented in **Tables 3-4.1 through 3-4.8**, along with the RME parameters used for each receptor evaluated in the HHRA, as discussed in Section 3.2.3. Absorption factors and other parameters used in the calculation of dermal dose were obtained from USEPA guidance and are presented in **Attachment E-1**.

3.2.5 Exposure Point Concentrations

To evaluate the magnitude of potential human exposures, the concentration of each COPC in each exposure medium/exposure area is estimated. The estimate of this exposure point concentration is referred to as an EPC. EPCs for evaluation of the RME scenario for each of the COPCs identified within a medium/exposure area are described below.

In accordance with USEPA guidance (USEPA, 1989; 2002b), EPCs for evaluation of COPCs in the HHRA were set to equal the 95% UCL on the arithmetic mean concentration. The maximum detected concentration was used as the EPC when (1) the 95% UCL for a COPC exceeded the maximum detected concentration because of small sample sizes or high data set variability; or (2) where a sufficient sample size or FOD was not available for ProUCL to calculate a reliable statistic, in which case it provided a warning or other message indicating a UCL is not recommended. Maximum detected concentrations were not substituted for UCLs greater than the maximum detect for ISM datasets (PCBs only).

3.2.5.1 Soil

Soil EPCs were calculated differently for discrete and ISM datasets. The EPCs for Total PCB Aroclors in surface and subsurface soil within the on-Project Blue Beach area (ISM soil datasets) are equal to the weighted mean UCL concentration of the SU-specific 95% UCLs based on SU size (acreage), calculated as described in Section 2.2.4.2. Soil EPCs for all other COPCs associated with discrete sample datasets are equal to the 95% UCL concentration, calculated as described in Section 2.2.4.1, or the maximum detected concentration if an appropriate 95% UCL was not calculated by ProUCL due to one of the scenarios previously described.

In the off-Project Maple Swamp/tidal stream area, Total PCB Aroclors and benzo(a)pyrene were detected at a low FOD in surface soil and subsurface soil, respectively. Therefore, 95% UCLs could not be calculated. In these cases, the maximum detected concentrations were conservatively used as the EPCs. Naphthalene was identified as a subsurface soil COPC in the off-Project Red Maple Swamp/tidal stream area based on results from both SVOC and VOC analytical methods. Naphthalene results were summarized separately based on both the SVOC and VOC method results throughout the COPC selection process and the development of EPCs. The higher of the EPCs (i.e., the EPC calculated from the results from the VOC method) is the selected EPC for further evaluation of naphthalene in subsurface soil in the off-Project Red Maple Swamp/tidal stream area.

The complete set of EPCs for surface soil and subsurface soil within the on-Project Blue Beach area and off-Project Red Maple Swamp/tidal stream area are presented in **Tables 3-3.1 and 3-3.2**, respectively.

3.2.5.2 Hydric Soil

Hydric soil EPCs are equal to the 95% UCL concentration, calculated as described in Section 2.2.4.1, for COPCs except for PCBs. Total PCB Aroclors were detected at a low FOD in subsurface hydric soil. Therefore, a 95% UCL could not be calculated. The EPC for Total PCB Aroclors in subsurface hydric soil in the off-Project Red Maple Swamp/tidal stream area is conservatively equal to the maximum detected concentration. The complete set of EPCs for surface hydric soil and subsurface hydric soil within the off-Project Red Maple Swamp/tidal stream area are presented in **Tables 3-3.3 and 3-3.4**, respectively.

3.2.5.3 Groundwater

COPCs were identified within the on-Project Blue Beach area for further evaluation of groundwater under a hypothetical future residential exposure scenario in which groundwater would be used as a source of drinking water or for showering/bathing. COPCs were also identified in shallow groundwater within the on-Project Blue Beach area for further evaluation of a current/future construction/utility worker exposure scenario. Groundwater data for COPCs were reviewed to identify samples within the core of the plume for use in deriving EPCs, consistent with USEPA guidance (USEPA, 2014b). No distinct groundwater plumes were identified, and the areas of higher concentration varied by COPC. However, two wells (MW-101S and MW-103) did not have any detections of groundwater COPCs at concentrations greater than the associated screening levels (described in Section 3.1.1.2). Therefore, these wells

were excluded from the EPC calculations for groundwater and shallow groundwater to avoid the potential for these lower concentrations outside of the area of higher concentrations to bias the groundwater EPCs low.

EPCs for both the groundwater and shallow groundwater datasets are equal to the 95% UCL concentration, calculated as described in Section 2.2.4.1, or the maximum detected concentration if an appropriate 95% UCL was not calculated by ProUCL due to one of the scenarios previously described. The EPC was equal to the maximum detected concentration for multiple COPCs within the groundwater and shallow groundwater datasets due to a low FOD. Naphthalene was identified as a groundwater COPC in the on-Project Blue Beach area based on results analyzed by SVOC and VOC methods. As with soil, the higher of the EPCs for naphthalene (in this case, the EPC presented for the SVOC method) is the selected EPC for further evaluation of naphthalene in groundwater in the on-Project Blue Beach area.

Lead was identified as a COPC in groundwater. The EPC for lead is equal to the arithmetic mean concentration (i.e., rather than the 95% UCL on the arithmetic mean) in accordance with USEPA guidance (USEPA, 2003a and 2007).

The complete set of EPCs for groundwater and shallow groundwater within the on-Project Blue Beach area are presented in **Tables 3-3.5 and 3-3.7**, respectively.

3.2.5.4 Sediment

One sediment COPC was identified in the off-Project Red Maple Swamp/tidal stream area. The sediment EPC is equal to the 95% UCL concentration, calculated as described in Section 2.2.4.1. The EPC for sediment within the off-Project Red Maple Swamp/tidal stream area is presented in **Table 3-3.9**.

3.2.5.5 Surface Water

Two surface water COPCs were identified in the off-Project Red Maple Swamp/tidal stream area. Both COPCs were only detected in 1 out of 10 samples in the dataset. Therefore, the surface water EPCs for both COPCs are conservatively equal to the maximum detected concentration due to the low FOD. The EPCs for surface water within the off-Project Red Maple Swamp/tidal stream area are presented in **Table 3-3.10**.

3.2.5.6 Soil Vapor

Three soil vapor COPCs were identified in the on-Project Blue Beach area. These COPCs were detected in one of the six samples in the dataset. The soil vapor EPCs are conservatively equal to the maximum detected concentration. The EPCs for soil vapor within the on-Project Blue Beach area are presented in **Table 3-3.11**.

3.2.5.7 Outdoor Air (Fugitive Dust and Volatiles), Shower Air, and Trench Air

EPCs for COPCs in outdoor air (fugitive dust and volatiles), shower air, and trench air were estimated as discussed in this section.

Fugitive Dust and Volatiles in Outdoor Air

For the soil COPCs, the concentration in fugitive dust originating from soil was estimated by combining the surface soil or subsurface soil EPC (as applicable) with a particulate emission factor (PEF). The USEPA-recommended default PEF of 1.36×10^9 m^3/kg for a non-excavation scenario (USEPA, 2002a) was used for evaluation of the outdoor worker, trespasser, recreational user, and hypothetical future residential exposure scenarios. The USEPA-recommended default PEF of 7.74×10^5 m^3/kg for unpaved road traffic as part of an excavation scenario (USEPA, 2002a) was used for evaluation of the construction/utility worker exposure scenario. Fugitive dust EPCs are not presented separately, as the PEF is applied to the soil EPC in the risk calculation spreadsheets (**Tables 3-7.1 through 3.7.7**).

For the volatile soil COPCs, the concentration of volatiles in outdoor air originating from soil was estimated by combining the surface soil or subsurface soil EPC (as applicable) with a receptor/area-specific volatilization factor (VF) calculated in accordance with USEPA guidance (2002a). The VF calculations are included in **Attachment E-2**.

Shower Air

For evaluation of the bathing/showering pathway, concentrations of volatiles in the shower were modeled using the Foster and Chrostowski (1987) shower model. The shower model was used to estimate the concentrations in shower air resulting from a unit groundwater concentration (1 microgram per liter [µg/L]). The shower air concentrations estimated based on the unit groundwater concentration were then multiplied by the chemical-specific groundwater

EPCs in **Table 3-3.5** to estimate the shower air EPCs. The shower model used to estimate shower air EPCs is presented in **Attachment E-3**. Shower air EPCs are presented in **Table 3-3.6**.

Trench Air

Excavation trench air concentrations of COPCs resulting from volatilization from groundwater infiltrating an excavation trench were modeled by the use of the method recommended by USEPA (1994) for predicting volatilization from standing water. The trench model was used to estimate the concentrations in trench air resulting from a unit groundwater concentration (1 µg/L). The trench air concentrations estimated based on a unit groundwater concentration were then multiplied by the chemical-specific shallow groundwater EPCs in **Table 3-3.7** to estimate the concentrations of volatile COPCs in outdoor air within an excavation trench. The trench model used to estimate trench air EPCs is presented in **Attachment E-4**. Trench air EPCs are presented in **Table 3-3.8**.

Vapor Intrusion Pathway

Soil vapor EPCs for COPCs identified within the on-Project Blue Beach area (presented in **Table 3-3.11)** were further evaluated using USEPA's VISL Calculator (USEPA, 2020b). The VISL Calculator utilizes USEPA's default soil vapor to indoor air attenuation factor of 0.03 (USEPA, 2015b) to provide a conservative estimate of the indoor air concentration that may be present in an overlying building under a scenario in which the vapor intrusion pathway is complete (i.e., no vapor barrier). The VISL Calculator then estimates the potential ELCR and noncancer HQ associated with the modeled indoor air concentration. The VISL Calculator outputs for the on-Project Blue Beach area future indoor worker and hypothetical future residential exposure scenarios are presented in **Attachment E-5**.

3.3 Toxicity Assessment

The purpose of the toxicity or dose-response assessment is to identify the types of adverse health effects a chemical may potentially cause, and to define the relationship between the dose of a chemical and the likelihood or magnitude of an adverse effect (response) (USEPA, 1989). The USEPA's guidance regarding the hierarchy of sources of human health dose-response values in risk assessment was used (USEPA, 2003b; 2018b) and is presented below:

- Tier 1: USEPA's Integrated Risk Information System (IRIS) (USEPA, 2020d);
- Tier 2: Provisional Peer-Reviewed Toxicity Values (PPRTVs) obtained from USEPA via the USEPA National Center for Environmental Assessment (NCEA) in Cincinnati, Ohio (USEPA, 2020e);
- Tier 3: Other sources of dose-response values include, California EPA's Office of Environmental Health and Hazard Assessment (OEHHA) Toxicity Criteria Database (CalEPA, 2020f), Minimal Risk Levels (MRLs) published by the Agency for Toxic Substances and Disease Registry (ATSDR, 2020), and the Health Effects Assessment Summary Tables (HEAST) (USEPA, 1997a).

Where published dose-response values were not available for a chemical, dose-response values based on surrogate chemicals (i.e., chemicals with structural similarities) were identified. The chosen surrogate is referenced in the summary table(s) of dose-response values (**Tables 3-5.1 to 3-5.2 and Tables 3-6.1 to 3-6.2**).

3.3.1 Toxicity Information for Noncarcinogenic Effects

Systemic toxic effects other than cancer can be associated with exposures to chemicals. Reference doses (RfDs) for oral exposures, and reference concentrations (RfCs) for inhalation exposures, are the toxicity values that are used to evaluate the potential of developing noncarcinogenic effects because of exposure to chemicals. RfDs and RfCs were developed based on the premise that there are protective mechanisms that must be overcome before an appreciable risk of adverse health effects is manifested during a defined exposure period. It is assumed that there is a threshold dose that must be exceeded before adverse effects can occur.

Chemicals classified as carcinogens may also produce other systemic effects. These chemicals were also evaluated for potential noncarcinogenic toxic effects and were included in the determination of chronic toxicity HQs, which characterize noncancer hazards. Carcinogenic effects, however, are usually manifested at levels that are significantly lower than those associated with systemic toxic effects; thus, cancer is usually the predominant adverse effect for chemicals that may elicit carcinogenic and noncarcinogenic responses.

Table 3-5.1 summarizes the oral noncarcinogenic toxicity values (i.e., RfDs) and the corresponding critical effects for the COPCs identified. **Table 3-5.2** summarizes the inhalation noncarcinogenic toxicity values (i.e., RfCs) and the corresponding critical effects for the COPCs.

Tables 3-5.1 and 3-5.2 contain both chronic and subchronic toxicity values. Subchronic toxicity values are applicable to the construction/utility worker scenario where exposures are expected to occur over a brief (i.e., 1 year) duration. Chronic toxicity values are applicable to the other receptors whose exposures are expected to occur over a longer interval of time. Subchronic toxicity values are not generally found in IRIS. If published subchronic toxicity factors are not available from Tier 2 or 3 sources, subchronic toxicity values were derived from chronic toxicity values. According to USEPA guidance (USEPA 1989), if a chronic toxicity value has been developed based on subchronic data, a subchronic toxicity value may be calculated by removal of the uncertainty factor used to extrapolate from subchronic to chronic exposures (typically a factor of 10). If subchronic toxicity values are not available and the chronic toxicity value is derived from chronic data, the chronic toxicity value is adopted as the subchronic toxicity value.

3.3.2 Toxicity Information for Carcinogenic Effects

The potential for human carcinogenic effects is evaluated based on the chemical-specific CSFs and unit risk factors (URFs) values along with the weight-of-evidence classification (categories A through E) of the USEPA (USEPA, 1989). The CSF and URF values are the toxicity values that quantitatively define the dose-response relationship of a known or suspected carcinogen. The CSF and URF values are a mathematical extrapolation of the slope of the dose-response curve from high doses administered to animals (or the exposures observed in human epidemiological studies) to the doses estimated for exposure in the environment. The USEPA has developed CSFs and URFs for chemicals classified as carcinogens based on the premise that there is no threshold (i.e., there is no level of exposure below which there is no risk of a carcinogenic effect).

USEPA's Guidelines for Carcinogen Risk Assessment (USEPA 2005a) classifies human carcinogenic potential as "known/likely," "cannot be determined," and "not likely" to replace the weight of evidence categories A through E. The guidelines also acknowledge that the mode of action of a carcinogen may involve both threshold and non-threshold mechanisms.

Table 3-6.1 summarizes the oral carcinogenic toxicity values (i.e., CSFs) and the corresponding weight-of-evidence classifications. **Table 3-6.2** summarizes the inhalation carcinogenic toxicity values (URFs).

The quantitative evaluation of potential risks for carcinogens with a mutagenic mode of action (i.e., carcinogenic PAHs and trichloroethene) followed USEPA guidance for early life exposure to carcinogens (USEPA, 2005a). Specifically, the quantification of cancer risks for child receptor involves the use of age-dependent adjustment factors (ADAFs). An ADAF of 10 was used for childhood exposures occurring from birth to 2 years of age, an ADAF of 3 was used for exposures occurring between the ages of 2 and 16 years, and an ADAF of 1 was used for adult exposures (USEPA, 2005), including the worker receptors, recreational adult, and residential adult.

Vinyl chloride also acts via a mutagenic model of action. However, the CSFs for vinyl chloride account for mutagenic effects, therefore, application of the ADAFs is not necessary for evaluation of mutagenic mode of action for vinyl chloride. The methodology for evaluating mutagenic mode of action is further discussed in Section 3.5.

3.3.3 Adjustment of Toxicity Factors

No RfDs or CSFs are available for evaluating dermal exposure. Therefore, carcinogenic risk and noncarcinogenic hazard associated with dermal exposure may be evaluated using an oral CSF or RfD adjusted such that the toxicity value is appropriate for the dermal pathway. As detailed by USEPA (2004), for purposes of evaluating dermal exposure, it is generally necessary to adjust an oral toxicity factor (i.e., RfD or CSF) from an administered (i.e., applied) dose to an absorbed (i.e., internal) dose. Because the toxicity values for the COPCs are expressed as oral doses (i.e., applied or intake-based), it is necessary to adjust both the RfDs and CSFs for these substances in estimating exposure on an absorbed-dose basis when assessing dermal exposure.

The oral RfDs and oral CSFs for each COPC were modified according to the following equations (USEPA, 2004) for use in assessing dermal exposure:

$$RfD_{ABS} = RfD_o \times ABS_{GI}$$

$$SF_{ABS} = SF_o / ABS_{GI}$$

Where:

RfD_{ABS} = Absorbed RfD (i.e., adjusted dermal RfD) (milligram per kilogram per day [mg/kg-day])

RfD_o = Oral RfD (mg/kg-day)

ABS_{GI} = Fraction of chemical absorbed in gastrointestinal tract (dimensionless) in critical toxicity study. Absolute oral bioavailability factor for each chemical (i.e., oral to dermal adjustment factor)

SF_{ABS} = Absorbed slope factor (i.e., adjusted dermal slope factor)

SF_o = Oral slope factor $(mg/kg\text{-}day)^{-1}$

Table 3-5.1 and Table 3-6.1 present the oral to dermal adjustment factors used to adjust the oral toxicity criteria for the COPCs evaluated in the dermal exposure pathways. Absorption factors and other parameters used in the calculation of dermal dose were obtained from USEPA guidance and are presented in **Attachment E-1**.

3.3.4 Chemical-Specific Information

The following chemical-specific approaches were followed in the HHRA:

Arsenic

Arsenic was identified as a COPC in subsurface soil and hydric surface soil within the off-Project Red Maple Swamp/tidal stream area and in groundwater and shallow groundwater in the on-Project Blue Beach area. To assess the oral bioavailability of arsenic in soil, a relative bioavailability factor of 0.6 (i.e., 60%) has been applied to the ingestion risk calculations. Because the oral RfD and CSF for arsenic are based on drinking water studies and the oral absorption of arsenic from water has been shown to be higher than the absorption of arsenic from a solid matrix, the relative bioavailability factor has been developed as an upper-bound estimate of the oral absorption efficiency of soil-borne arsenic (USEPA, 2012). The relative bioavailability factor is not applicable to the dermal route of exposure. However, because hydric soil is a soil-like matrix, the soil arsenic relative bioavailability factor has also been used for arsenic in hydric soil. The evaluation of incidental ingestion of soil associated with other COPCs utilizes a relative bioavailability factor of 1 (i.e., 100%).

Chromium

Many metals can exist in different oxidation states; for some metals, the oxidation state can have different toxicities. This is the case for chromium. Chromium exists in two common oxidation states: trivalent chromium (chromium-3, Cr[III], or Cr+3), and hexavalent chromium (chromium-6, Cr[VI], or Cr+6). Trivalent chromium is essentially nontoxic as evidenced by its residential soil RSL of 120,000 mg/kg (USEPA, 2020a). It can be bought over-the-counter as a supplement and is included in most vitamins. USEPA has classified hexavalent is a human carcinogen by the inhalation route of exposure (USEPA, 2020d).

Chromium is most commonly present in the environment in the trivalent state because typical conditions in the environment favor the reduction of chromium from the hexavalent to the trivalent state. Hexavalent chromium in soil is expected to be reduced to trivalent chromium by organic matter, and is facilitated by low pH (ATSDR, 2012). In addition, if hexavalent chromium is ingested, it is rapidly converted to the trivalent form after entering the stomach. Therefore, hexavalent chromium is not considered by USEPA to pose a cancer risk via the ingestion route of exposure (USEPA, 2020f).

There is no evidence to suggest that hexavalent chromium is present at the Site. Therefore, in the absence of soil screening levels for total chromium, soil screening levels for trivalent chromium were used. The only medium in which total chromium was identified as a COPC is groundwater, based on the maximum detected concentration being

greater than the associated MCL. However, the maximum detected concentration of total chromium in groundwater did not exceed the tapwater RSL for trivalent chromium.

In the absence of published toxicity values for total chromium, toxicity values for trivalent chromium were used to assess chromium in the HHRA.

Lead

Lead was identified as a COPC in groundwater. Uncertainties in the dose-response relationship between exposure to lead and biological effects make it unclear whether the noncarcinogenic effects of lead exhibit a threshold response. Therefore, a published RfD for lead is not available. Although USEPA has classified lead as a B2 (probable human) carcinogen, no CSF has been developed. Therefore, potential exposures to lead cannot be evaluated using the traditional methods of risk assessment. Lead in groundwater was evaluated in comparison to the Safe Drinking Water Act (SDWA) action level of 15 µg/L, presented on the USEPA MCL table (USEPA, 2018b).

Total PCB Aroclors

Cancer toxicity values for Total PCBs (high risk and persistence) recommended in USEPA's IRIS database (2020d) were used for evaluation of Total PCBs. The oral RfD for PCB Aroclor 1254 (USEPA, 2020d) was used to evaluate noncarcinogenic oral/dermal pathways.

Carcinogenic PAHs

The CSF and IUR for benzo(a)pyrene, along with the appropriate relative potency factors (USEPA, 1993a), have been used to evaluate the potency of the individual carcinogenic PAHs (benzo(a)anthracene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene. Only benzo(a)pyrene has an oral RfD and an inhalation RfC. Consistent with the USEPA RSL table (USEPA, 2020a), RPFs are not used to develop RfDs and RfCs for the remaining carcinogenic PAHs.

Trichloroethene

USEPA (2020d) characterizes trichloroethene as carcinogenic to humans based on human epidemiological studies on kidney and liver tumors and non-Hodgkin's lymphoma. Trichloroethene acts by a mutagenic mode of action for the induction of kidney tumors. Thus, USEPA has published separate CSFs and URFs associated with each of these target endpoints. Therefore, ADAFs are applied for the evaluation of the mutagenic mode of action associated with the induction of kidney tumors using the CSFs and URFs associated with this endpoint. ADAFs are not applied to the CSFs and URFs associated with the non-Hodgkin's lymphoma endpoint.

3.4 Risk Characterization

Risk characterization combines estimates of exposure with toxicity data to develop estimates of the probability that an adverse effect will occur under the specified conditions of exposure. The risk characterization was divided into three phases: (1) risk estimation, (2) risk description, and (3) uncertainty analysis.

Risk estimation is undertaken by combining the toxicity factors and exposure assessment equations to calculate estimates of potential risks. Noncarcinogenic risks are reported as a pathway-specific hazard index (HI), which is the sum of individual COPC HQs for that pathway. Estimates of carcinogenic risks are reported as ELCRs. Current practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances. Risk description entails several discussions, including the relative contributions of individual exposure pathways to the total potential risk for each medium. The significance of the risk estimates is relative to risk management criteria set forth in USEPA policy. The uncertainty analysis describes and quantifies, where possible, the impact of data uncertainty and variability, exposure assumptions, and toxicity values on estimates of potential risk.

3.5 Estimation of Potential Risk and Hazard

Noncancer hazard is estimated by means of a HQ. To calculate noncarcinogenic HQs, the ADDs or ADEs, calculated as described in Section 3.2.4 were divided by the RfDs or RfCs as follows:

- Oral/dermal: HQ = ADD (mg/kg-day) ÷ RfD (mg/kg-day)
- Inhalation: HQ = ADE (mg/m^3) ÷ RfC (mg/m^3)

The sum of this ratio for all chemicals within an exposure point and pathway that have the same target organ or type of toxicity is termed the pathway HI. The HI is useful as a reference point for gauging potential effects of environmental exposures to complex mixtures but cannot be equated to a probability or effect level. In general, HIs that are less than 1 are not of regulatory concern; however, a HI of greater than 1 does not automatically indicate that an adverse effect will occur and should not automatically be interpreted as posing an unacceptable risk to the exposed population. Both USEPA and RIDEM use a target HI per target organ of 1 (USEPA 1991; RIDEM, 2019) as the acceptable HI.

The total pathway HI for each exposure point was calculated by summing the HQs for COPCs that have similar systemic effects. Total HIs for each receptor by medium were calculated by summing the total HIs across pathways within the media (e.g., summing dermal and ingestion soil risk estimates). As a first approximation, all COPCs are assumed to have additive effects. Total HIs, assuming additivity of effects, are presented per media and exposure pathway in **Tables 3-7.1 through 3-7.7**. In cases where the total HI, assuming additivity of effects, for a receptor exceeded 1, only COPCs that have similar systemic effects (i.e., target organs) were summed for each pathway and medium. Total HIs, assuming additivity of effects, exceeded 1 only for the hypothetical future residential scenario. Total HIs per target organ for the hypothetical future residential scenario are presented in **Tables 3-9.9 and 3-9.10**.

The potential cancer risk for each receptor is estimated for each medium by means of an ELCR. USEPA (1991) states that where the cumulative incremental current or future potential ELCR to an individual is less than 10^{-4}, action generally is not warranted unless there are adverse environmental impacts. RIDEM uses a target cumulative ELCR of 1×10^{-5} (RIDEM, 2019) to define acceptable risk.

To calculate the ELCR, the chemical- and pathway-specific LADDs calculated as described in Section 3.2.4 were multiplied by CSFs or URFs as follows:

- Oral/Dermal: ELCR = LADD (mg/kg-day) x CSF $(mg/kg\text{-}day)^{-1}$
- Inhalation ELCR = LADE (milligram per cubic meter [mg/m^3]) x URF (microgram per cubic meter [$\mu g/mg^3$])$^{-1}$ x 1,000 µg/mg

The resulting value represents the incremental upper-bound probability that an individual could develop cancer over his or her lifetime due to exposure to potential carcinogens under the conditions specified in the exposure scenario. For example, carcinogenic risk levels of 10^{-6} and 10^{-4} represent an incremental chance of one-in-one-million and one-in-ten-thousand, respectively, that an individual could contract cancer over a lifetime.

The potential cancer risk for each pathway (e.g., the soil ingestion pathway) was calculated by summing the potential risks from each COPC at each exposure point within the pathway, and receptor risks for each medium were calculated by summing ELCRs for each pathway within the medium (e.g., the soil incidental ingestion and dermal contact pathways). Pathway ELCRs are calculated in **Tables 3-7.1 through 3-7.7**. Total potential ELCRs are presented per area, media and exposure pathway in **Tables 3-9.1 through 3-9.10**.

Carcinogenic PAHs, TCE, and vinyl chloride were selected as COPCs in one or more media. These chemicals have been determined by USEPA to produce tumors through a mutagenic mode of action. USEPA has developed CSFs and URFs for vinyl chloride specific to life-stage. The quantification of potential cancer risks PAHs and TCE followed USEPA guidance entitled *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens* (USEPA, 2005a). The quantification of potential cancer risks for the adolescent trespasser, recreational user and hypothetical resident uses ADAFs for each of the chemicals identified as COPCs with mutagenic modes of action. Specifically, an ADAF of 10 was used for exposures occurring to children from birth to 2 years of age and an ADAF of 3 was used for exposures occurring between the ages of 2 and 16 years. The following general equation demonstrates how ADAFs are incorporated into the oral/dermal and inhalation risk calculations:

$$Risk_{oral/dermal} = \text{Exposure dose (mg/kg-day)} \times CSF\ (mg/kg\text{-}day)^{-1} \times ADAF$$

$$Risk_{inhalation} = \text{Exposure concentration } (\mu g/m^3) \times IUR\ (\mu g/m^3)^{-1} \times ADAF$$

In this HHRA, the residential and recreational user exposure scenarios include evaluation of a child and adult. The child age range consists of a young child, ages 0 to less than 6 years old. For the residential and recreational child receptors, a combined age-weighted ADAF of 5.3 was calculated as shown below:

Combined, age-weighted ADAF representative of a child (0 to <6 years) =

$$ADAF_{0-<2\ years}\ (10) \times (2\ years/6\ years) + ADAF_{2-<6\ years}\ (3) \times (4\ years/6\ years) = 5.3.$$

The above ADAF is applied in the calculation of risk in **Tables 3-7.4 through 3-7.7**. Application of the combined age-weighted ADAFs to the exposure dose/concentration associated with the entire age range (i.e., 0 to <6 years) is mathematically equivalent to the application of the individual ADAFs of 10 and 3 to the exposure dose/concentrations for the associated individual age ranges of 0 to <2 years and 2 to <6 years, respectively.

Table 3-11 provides a summary of the total potential ELCRs and noncarcinogenic HIs for each of the receptors evaluated. Total potential ELCRs and target organic-specific HIs above USEPA target levels are identified in bold font. **Table 3-11** also lists the chemicals identified as risk drivers for each exposure scenario in which the total potential ELCR or total potential HI are above USEPA target levels (i.e., total ELCR > 10^{-4}, and total HI > 1 per target endpoint). For each associated exposure scenario (i.e., area/receptor/medium) with a potential risk/HI above USEPA target levels, risk drivers were selected from those COPCs significantly contributing to an individual ELCR > 10^{-4} or target organ HI > 1 (at one significant figure), specifically, COPCs with an individual ELCR > 10^{-6} or HI > 1. Summary tables showing the total receptor ELCRs and HIs for risk drivers only are presented in **Table 3-10.1**. These risk drivers are selected as chemicals of concern (COCs) in the associated medium for the associated receptor/exposure scenario.

3.5.1 Description of Estimated Potential Risks and Hazards

This subsection summarizes the human health risks potentially associated with exposures to COPCs in environmental media (surface soil, subsurface soil, hydric surface soil, groundwater, shallow groundwater, sediment, surface water, and soil vapor) in the on-Project and off-Project areas, as applicable. Individual chemical-specific noncarcinogenic risks are expressed as HIs and carcinogenic risks are expressed as probabilities of developing cancer (i.e., ELCRs). Noncarcinogenic hazards and carcinogenic risks were calculated for RME scenarios. The RME represents the reasonable maximum exposure and potential risk a receptor may receive from an exposure point.

For the recreational and residential receptors, child and adult ELCRs have been summed to present the total potential ELCR for the receptor within each exposure area. However, because the child is the most sensitive receptor for the estimation of noncarcinogenic risks, only the child receptor HIs were presented for these receptors.

Table 3-11 provides a summary of the total potential ELCR and total potential noncarcinogenic HI and risk drivers by area, receptor, and media.

Current/Future Construction/Utility Worker

A current/future construction/utility worker scenario was evaluated for exposure within the on-Project Blue Beach area to COPCs in surface and subsurface soil through incidental ingestion, dermal contact, and inhalation of fugitive dust and volatiles in outdoor air; incidental ingestion and dermal contact with shallow groundwater, and inhalation of volatiles in the air of an excavation trench (trench air). The estimated potential ELCRs and noncancer HIs for a current/future construction worker are provided for each exposure medium in **Table 3-7.1**. The total potential RME ELCRs and HIs for a current/future construction/utility scenario are presented for surface soil, shallow groundwater, and trench air in **Table 3-9.1** and for subsurface soil, shallow groundwater, and trench air in **Table 3-9.2**.

The total potential ELCRs and noncancer HIs associated with the current/future construction/utility worker scenario are summarized below:

- The cumulative potential ELCR and total potential HI associated with exposure to surface soil, shallow groundwater, and trench air within the on-Project Blue Beach area under a current/future scenario are 1×10^{-6} and 0.5, respectively.

- The cumulative potential ELCR and total potential HI associated with exposure to subsurface soil, shallow groundwater, and trench air within the on-Project Blue Beach area under a current/future scenario are 1×10^{-6} and 0.5, respectively.

Further evaluation of total potential HI per target organ was not performed because the total potential HI for the combined endpoints did not exceed 1. The cumulative potential ELCRs and total potential HIs associated with the construction/utility worker exposure scenario in the on-Project Blue Beach area do not exceed USEPA's ELCR risk range of 10^{-6} to 10^{-4} or USEPA's target HI of 1. These ELCR/HI results also do not exceed RIDEM's target cumulative risk level of 1×10^{-5} and target HI of 1. Therefore, no risk drivers or COCs were selected for this receptor.

Current/Future and Future Outdoor Worker

An outdoor worker scenario was evaluated for exposure within the on-Project Blue Beach area to COPCs in soil through incidental ingestion, dermal contact, and inhalation of fugitive dust and volatiles in outdoor air. The current/future land use scenario included the evaluation of surface soil, and the future land use scenario included the evaluation of subsurface soil, assuming under a hypothetical future land use scenario subsurface soils may be brought to the surface and made available for contact. The estimated potential ELCRs and noncancer HIs for an outdoor worker scenario are provided by exposure medium in **Tables 3-7.1**. The total potential RME ELCRs and HIs are presented for a current/future outdoor worker scenario in **Table 3-9.3** and for a future outdoor worker scenario in **Table 3-9.4**.

The total potential ELCRs and noncancer HIs associated with the outdoor worker scenarios area are summarized below:

- The cumulative potential ELCR and total potential HI associated with exposure to surface soil within the on-Project Blue Beach area under a current/future scenario are 4×10^{-7} and 0.02, respectively.
- The cumulative potential ELCR and total potential HI associated with exposure to subsurface soil within the on-Project Blue Beach area under a future scenario are 1×10^{-6} and 0.1, respectively.

Further evaluation of total potential HI per target organ was not performed because the total potential HI for the combined endpoints did not exceed 1. The cumulative potential ELCRs and total potential HIs associated with the current/future and future outdoor worker exposure scenarios in the on-Project Blue Beach area do not exceed USEPA's ELCR risk range of 10^{-6} to 10^{-4} or USEPA's target HI of 1. These ELCR/HI results also do no exceed RIDEM's target cumulative risk level of 1×10^{-5} and target HI of 1. Therefore, no risk drivers or COCs were selected for this receptor.

Current/Future Trespasser

An adolescent trespasser scenario was evaluated for exposure to COPCs in soil from the on-Project Blue Beach area through incidental ingestion, dermal contact, and inhalation of fugitive dust and volatiles in outdoor air. The current/future land use scenario included the evaluation of surface soil, and the future land use scenario included the evaluation of subsurface soil, assuming under a hypothetical future land use scenario, that subsurface soils may be brought to the surface and would be available for contact. The estimated potential ELCRs and noncancer HIs for an adolescent trespasser scenario are provided for each exposure medium in **Tables 3-7.3**. The total potential RME ELCRs and HIs are presented for a current/future adolescent trespasser scenario in **Table 3-9.5** and for a future adolescent trespasser scenario in **Table 3-9.6**.

The total potential ELCRs and noncancer HIs associated with the adolescent trespasser scenarios area are summarized below:

- The cumulative potential ELCR and total potential HI associated with exposure to surface soil within the on-Project Blue Beach area under a current/future scenario are 2×10^{-8} and 0.004, respectively.
- The cumulative potential ELCR and total potential HI associated with exposure to subsurface soil within the on-Project Blue Beach area under a future scenario are 3×10^{-8} and 0.008, respectively.

Further evaluation of total potential HI per target organ was not performed because the total potential HI for the combined endpoints did not exceed 1. The cumulative potential ELCRs and total potential HIs associated with the

current/future and future adolescent trespasser exposure scenario in the on-Project Blue Beach area do not exceed USEPA's ELCR risk range of 10^{-6} to 10^{-4} or USEPA's target HI of 1. These ELCR/HI results also do no exceed RIDEM's target cumulative risk level of 1×10^{-5} and target HI of 1. Therefore, no risk drivers or COCs were selected for this receptor.

Current/Future Recreational User

A recreational user (adult/child) scenario was evaluated for exposure within the off-Project Red Maple Swamp/tidal stream area to COPCs in soil through incidental ingestion, dermal contact, and inhalation of fugitive dust and volatiles in outdoor air, in hydric surface soil and sediment through incidental ingestion and dermal contact, and in surface water through dermal contact under a limited wading scenario. The current/future land use scenario included the evaluation of surface soil, and the future land use scenario included the evaluation of subsurface soil, conservatively assuming under a hypothetical future land use scenario that subsurface soils within the walking path may be brought to the surface and made available for contact. The estimated potential ELCRs and noncancer HIs for a recreational user scenario are provided for each exposure medium in **Table 3-7.4** (adult) and **Table 3-7.5** (child). The total potential RME ELCRs and HIs are presented for a current/future recreational user scenario in **Table 3-9.7** and for a future adolescent trespasser scenario in **Table 3-9.8**.

The total potential ELCRs and noncancer HIs associated with the recreational user scenarios area are summarized below:

- The cumulative potential ELCR and total potential HI associated with exposure to surface soil, hydric surface soil, sediment, and surface water within the off-Project Red Maple Swamp/tidal stream area under a current/future scenario are 1×10^{-6} and 0.05, respectively.
- The cumulative potential ELCR and total potential HI associated with exposure to subsurface soil, hydric surface soil, sediment, and surface water within the off-Project Red Maple Swamp/tidal stream area under a future scenario are 2×10^{-6} and 0.06, respectively.

Further evaluation of total potential HI per target organ was not performed because the total potential HI for the combined endpoints did not exceed 1. The cumulative potential ELCRs and total potential HIs associated with the current/future and future recreational user (adult/child) scenarios in the off-Project Red Maple Swamp/tidal stream area do not exceed USEPA's ELCR risk range of 10^{-6} to 10^{-4} or USEPA's target HI of 1. These ELCR/HI results also do not exceed RIDEM's target cumulative risk level of 1×10^{-5} and target HI of 1. Therefore, no risk drivers or COCs were selected for this receptor.

Hypothetical Future Resident

A hypothetical future (adult/child) scenario was evaluated for exposure within the on-Project Blue Beach area to COPCs in soil through incidental ingestion, dermal contact, and inhalation of fugitive dust and volatiles in outdoor air, and in groundwater through ingestion as drinking water and dermal contact and inhalation of volatiles while bathing/showering. The estimated potential ELCRs and noncancer HIs for a hypothetical future residential scenario are provided for each exposure medium in **Table 3-7.6** (adult) and **Table 3-7.7** (child). The total potential RME ELCRs and HIs for a hypothetical future residential scenario are presented for surface soil, groundwater, and shower air in **Table 3-9.9** and for subsurface soil, groundwater, and shower air in **Table 3-9.10**.

The total potential ELCRs and noncancer HIs associated with the hypothetical future residential scenario area are summarized below:

- The cumulative potential ELCR and total potential HI (for combined target endpoints) associated with exposure to surface soil, groundwater, and shower air within the on-Project Blue Beach area under a hypothetical future scenario in which groundwater is used as a source of drinking water and other potable use are 2×10^{-3} and 50, respectively. Further evaluation of total potential HI per target organ was performed. Target organ HIs ranged from 0.001 to 30.
- The cumulative potential ELCR and total potential HI (for combined target endpoints) associated with exposure to subsurface soil, groundwater, and shower air within the on-Project Blue Beach area under a hypothetical future scenario in which groundwater is used as a source of drinking water and other potable use are 2×10^{-3} and

0.5, respectively. Further evaluation of total potential HI per target organ was performed. Target organ HIs ranged from 0.001 to 30.

The cumulative potential ELCRs and total potential HIs associated with a hypothetical future residential (adult/child) exposure scenario for the on-Project Blue Beach area exceed USEPA's ELCR risk range of 10^{-6} to 10^{-4} and the USEPA target HI of 1. The hypothetical future resident ELCR/HI results also exceed RIDEM's target cumulative risk level of 1×10^{-5} and target HI of 1. The primary source of risk to the hypothetical future resident is from the groundwater pathways. The potential risk associated with surface soil of $2x10^{-6}$ and the noncancer HI of 0.3 are within the USEPA ELCR risk range of 10^{-6} to 10^{-4} and the USEPA target HI of 1.

The EPC for lead in groundwater within the on-Project Blue Beach area (19 µg/L) is greater than the USEPA SDWA action level of 15 µg/L, presented on the USEPA MCL table (USEPA, 2018b).

The following table provides a summary of the COPCs identified as COCs in groundwater for a hypothetical future residential exposure scenario in which groundwater is a source of potable water and exposure may occur based on the ingestion of groundwater as drinking water and/or dermal contact and inhalation while showering/bathing exposure pathways. The potential ELCR's and HIs associated with the groundwater exposure scenarios for each COC are also provided in the table.

Groundwater COCs	Potential ELCR	Potential HI
Inorganics		
Arsenic	6×10^{-5}	0.5
Iron	N/A	4
Lead	N/A	N/A
Manganese	N/A	7
SVOCs		
1-Methylnaphthalene	8×10^{-5}	0.1
2-Methylnaphthalene	N/A	2
Benzo(a)Pyrene	4×10^{-6}	0.02
Naphthalene	2×10^{-3}	20
VOCs		
TCE	6×10^{-5}	10
Vinyl Chloride	4×10^{-5}	0.04

N/A - Not applicable.

Soil vapor COPCs in the on-Project Blue Beach area were further evaluated using the USEPA VISL Calculator (USEPA, 2020b) (presented in **Attachment E-5**) to assess the potential risk/hazard associated with the vapor intrusion pathway under a hypothetical future residential use scenario in which residences would be constructed on the Project without a vapor mitigation system (i.e., vapor barrier). This scenario is not a likely future use scenario because the area is not zoned for residential use and an ELUR barring residential use of the parcel has been recorded. However, this scenario was evaluated in the HHRA for informational purposes under a UU/UE scenario. The total potential ELCR and total HI associated with residential exposure to soil vapor COPCs via the vapor intrusion pathway are 5×10^{-5} and 0.3, respectively. These results do not exceed USEPA's ELCR risk range of 10^{-6} to 10^{-4} or USEPA's target HI of 1.

Indoor Worker

Soil vapor COPCs in the on-Project Blue Beach area were evaluated using the USEPA VISL Calculator (USEPA, 2020b) (presented in **Attachment E-5**) to assess the potential risk/hazard associated with the vapor intrusion pathway under a future use scenario in which industrial buildings would be constructed in the on-Project Blue Beach area without a vapor mitigation system (i.e., vapor barrier). This scenario is not a likely future use scenario because Haywood Pool Products, which is currently located on the Project area, previously submitted a written statement to RIDEM that any future buildings constructed on their parcels would include a vapor barrier to prevent vapor intrusion. However, this scenario was evaluated in the HHRA for informational purposes. The total potential ELCR and total HI

associated with an indoor worker exposure to soil vapor COPCs via the vapor intrusion pathway are 5×10^{-6} and 0.07, respectively. These results do not exceed USEPA's ELCR risk range of 10^{-6} to 10^{-4} or USEPA's target HI of 1.

3.5.2 Uncertainty Discussion

For each step of the HHRA process, assumptions must be made due to a lack of absolute scientific knowledge. Some of the assumptions are supported by considerable scientific evidence, and others have less empirical background. Each assumption introduces some degree of uncertainty into the HHRA process. Regulatory HHRA methodology requires that conservative assumptions be made in each step of the HHRA process to ensure that public health is protected. Therefore, when all of the assumptions are combined (i.e., in the final numerical potential risk estimates), it is much more likely that risks are overestimated rather than underestimated.

The assumptions that introduce the greatest amount of uncertainty in this HHRA are discussed in this section. These are discussed in qualitative terms, given the conservative nature of the assumptions, the measured concentrations of constituents on the Site, and the identified current and future uses of the Site.

3.5.2.1 Hazard Identification

In general, the field sampling targeted areas with the potential to have been impacted by historical Project-related activities. This type of sampling is expected to bias results high given human receptors are not only present in these areas, but also in areas that are less impacted. ISM sampling was conducted for PCB Aroclors in soil within the on-Project Blue Beach area. This sampling approach is expected to provide a more accurate estimate of PCB Aroclors concentrations across the on-Project Blue Beach area than the discrete sampling conducted for other chemicals.

The chemicals detected in media on and in the vicinity of the Project were screened against conservative risk-based screening levels. Chemicals detected at concentrations greater than screening levels were selected as preliminary COPCs for further evaluation in comparison with the background dataset to select COPCs for quantitative evaluation in the HHRA. A subset of chemicals detected at a site is generally selected for quantitative analysis for several reasons. Some chemicals may be present at concentrations that can be assumed, with reasonable assurance, not to pose a risk to human health. A review of the results of HHRA demonstrate that in most cases risks are attributable only to one or a few chemicals, and that most of the chemicals quantitatively evaluated do not contribute significantly to total risk estimates (USEPA, 1993b). The screening process is conducted to identify the COPCs that contribute the greatest to potential risk. The screening process used in this HHRA is conservative. Additional conservatism was added by use of screening levels based on a target HQ of 0.1. Although the excluded chemicals may pose a level of risk, that risk would contribute negligibly to the total Project risk. Therefore, not evaluating the excluded chemicals does not measurably affect the numerical estimates of hazard or risk and will not affect remedial decision-making for the Project.

Environmental sample collection and laboratory analyses are intended to be representative of the location and media sampled. However, each step in the process includes the potential to lose representativeness and introduce bias. The values reported by the laboratory may not accurately represent the EPC for a given media and receptor. The magnitude of analytical error is usually small compared to other sources of uncertainty, although the relative uncertainty increases for results that are near the LOD. The reported concentrations of chemicals detected below the Limit of Quantitation (LOQ) but above the method detection limit (i.e., J-flagged data) are imprecise and are thus estimated concentrations. However, to minimize underestimation of Project concentrations, J-flagged data were included in the HHRA. Inclusion of these data in development of EPCs generally returns conservative exposure concentration and resulting risk estimates. In addition, non-detects for area-specific COPCs were included in the EPC calculation for that area at the full LOD and ProUCL calculates EPCs using various methods (i.e., KM) to estimate concentrations below the LOD. Inclusion of these data in the HHRA may provide an over-estimate or under-estimate of exposure and potential risk. The direction of the uncertainty is unknown and depends on the proportion of the J-qualified values and the magnitude to the LOQ relative to the decision limit.

The HHRA quantitatively evaluated the total (unfiltered) groundwater data for inorganic analytes. However, it is recognized that dissolved (filtered) groundwater data may better represent potential exposure to groundwater via the dermal contact exposure pathway for inorganics. Therefore, use of the total (unfiltered) groundwater data in the HHRA may over-estimate potential risk/hazard associated with inorganic COPCs. However, the potential ELCR/HI associated with the inorganic COCs (arsenic, iron, lead, and manganese) is a small fraction of the total potential ELCR/HI estimated for the hypothetical future resident groundwater exposure. Therefore, use of dissolved (filtered) groundwater data for inorganic COCs, which is expected to be lower than the total (unfiltered) results, would

negligibly change the total potential ELCR and total potential HI associated with a hypothetical future residential exposure to groundwater and would not change the conclusions of the HHRA.

3.5.2.2 Exposure Assessment

When estimating human doses (i.e., intakes) from potential exposure to various media containing COPCs, several assumptions are made. Uncertainty may exist, for example, in assumptions for the rates of ingestion, frequency and duration of exposure, and bioavailability of the chemicals in the environmental medium. When limited information is available as a basis for these assumptions, conservative (i.e., health-protective) estimates of potential exposure were made.

Exposure Assumptions

The intent of this HHRA was to evaluate “reasonable” exposure scenarios. However, the HHRA also evaluated several hypothetical exposure scenarios that are not likely to exist. For example, there are currently no residential receptors within the on-Project Blue Beach area; it is not zoned for residential use, and an ELUR barring residential use of the parcel has been recorded on the deed. Groundwater within the on-Project Blue Beach area is classified by RIDEM as ‘GB’, not suitable for drinking without treatment. Additionally, an ELUR recorded on the deed prohibits potable use of groundwater from the parcel. However, as a conservative measure, the on-Project Blue Beach area was evaluated for hypothetical future residential exposure scenarios to represent a UU/UE scenario.

The exposure inputs used to describe the extent, frequency, and duration of exposure are associated with some uncertainty. Actual risks for some individuals within an exposed population may vary from those predicted depending on the actual exposure durations, intake rates (e.g., soil ingestion rates), and body weights. The exposure assumptions were selected to produce a reasonable upper-bound estimate of exposure in accordance with USEPA guidelines. Therefore, exposures and estimated potential risks for the evaluated receptors are likely to be representative of reasonable upper-bound exposures.

Bioavailability

Bioavailability is the measure of the degree to which a chemical may be systemically absorbed following exposure. Oral bioavailability is a measure of the degree to which a chemical may be systemically absorbed following ingestion, and dermal bioavailability is a measure of the degree to which a chemical may absorb through the skin and into the blood stream. Some chemicals are absorbed almost completely (100% bioavailability) when ingested in pure form. Other chemicals may pass through the body largely unabsorbed. The amount of absorption that occurs is chemical and situation specific and is not always understood. To account for these uncertainties, USEPA’s default assumptions regarding absorption are conservative, and intended to apply to most sites and exposure conditions.

The HHRA was conducted using USEPA default soil/hydric sediment/sediment absorption factors for dermal exposure (USEPA, 2004) and an assumption of 100% relative oral absorption for all COPCs with the exception of arsenic. USEPA’s relative bioavailability factor of 0.6 was used for arsenic (USEPA, 2012). These estimates are uncertain and may result in either an overestimation or underestimation of risk.

Exposure Point Concentrations

EPCs used to estimate potential risk/HI associated with exposure to soil, hydric soil, groundwater, shallow groundwater, sediment, and surface water (based on discrete sampling datasets) in the HHRA were equal to the 95% UCL, unless the UCL was greater than the maximum detected concentration or an insufficient sample size or FOD was available for calculation of a UCL. In these cases, the EPC was set equal to the maximum detected concentration. The use of the maximum detected concentration to estimate potential risk/HI associated with COPCs with a low FOD may result in an over-estimation of potential risk/HI.

For the evaluation of Total PCB Aroclors in soil from ISM samples, a weighted mean UCL concentration of the SU-specific 95% UCLs based on SU size (acreage) was developed and used as EPC. This additional refinement was conducted to address uncertainty associated with the variability in the triplicate sample results and to ensure that a conservative estimate of a mean concentration representative of the on-Project Blue Beach exposure area was obtained, without inappropriately biasing the exposure point concentration toward a specific SU.

3.5.2.3 Toxicity Assessment

Uncertainty is associated with the toxicity values and toxicity information available to assess potential adverse effects. One of the major contributors to uncertainty is the accuracy of the toxicity values used. A cancer potency value is a mathematical extrapolation of the slope of the dose-response curve from high doses administered to animals (or the exposures observed in epidemiological studies) to the low doses commonly experienced in the environment. The USEPA has developed potency values for COPCs classified as carcinogens, based on the premise that there is no threshold (i.e., there is no level of exposure below which there is no risk of a carcinogenic effect). USEPA's Guidelines for Carcinogen Risk Assessment (USEPA, 2005a) acknowledges that the mode of action of a carcinogen may involve both threshold and non-threshold mechanisms. To the extent that the approach used to develop the potency estimate is incorrect, the extrapolated risks may be overestimations or underestimations. However, in the derivation of toxicity values, conservative assumptions are employed. Therefore, toxicity values tend to be biased toward overestimating potential risk.

For dermal exposure pathways, the absence of dermal toxicity criteria necessitated the derivation from oral toxicity data. To calculate potential risk estimates for the dermal pathway, gastrointestinal absorption efficiency factors that reflect the toxicity study conditions were used to modify the oral toxicity criteria. For the chemicals with gastrointestinal absorption efficiencies greater than 50%, 100% gastrointestinal absorption was used, in accordance with USEPA (2004). The potential risk estimates for the dermal pathways may be overestimated or underestimated depending on how closely these values reflect the difference between the oral and dermal routes. Chronic toxicity values, developed based on continuous lifetime exposures, were used for the evaluation of discontinuous, less-than-lifetime exposures (e.g., recreational user). Therefore, total receptor risk estimates may be overestimated with the degree of overestimation dependent on the degree of deviation from a continuous lifetime exposure scenario.

Total chromium was evaluated as trivalent chromium in this HHRA. Chromium is most commonly present in the environment in the trivalent state because typical conditions in the environment favor the reduction of chromium from the hexavalent to the trivalent state. Hexavalent chromium in soil is expected to be reduced to trivalent chromium by organic matter, which is facilitated by low pH (ATSDR, 2012). In addition, if hexavalent chromium is ingested, it is rapidly converted to the trivalent form after entering the stomach, and is therefore not considered by USEPA to pose a cancer risk via the ingestion route of exposure (USEPA, 2020f). Although the evaluation of total chromium as trivalent chromium introduces some level of uncertainty to the assessment, there is no evidence to suggest that hexavalent chromium is present at the Site.

Cancer toxicity values for total PCBs (high risk and persistence) recommended in USEPA's IRIS database (2020d) were used for evaluation of total PCBs. A published noncancer toxicity value (RfD) is not available for total PCBs. Therefore, the oral RfD for Aroclor 1254 (USEPA, 2020d) was used to evaluate noncarcinogenic oral/dermal pathways associated with exposure to total PCB Aroclors. There are uncertainties associated with using Aroclor 1254 as a surrogate for Total PCBs. Since the PCB composition at a site may differ from the PCB composition for which the noncancer RfD for Aroclor 1254 is based, producing different toxicological responses, uncertainty is introduced by using this as a surrogate RfD.

3.5.2.4 Risk Characterization

The potential risk of adverse human health effects is characterized based on estimated potential exposures and potential dose-response relationships. Three areas of uncertainty are introduced in this phase of the HHRA: the evaluation of potential exposure to multiple chemicals, the combination of upper-bound exposure estimates with upper-bound toxicity estimates, and the risk to sensitive populations.

Once potential exposure to and potential risk from each COPC are estimated, the total upper-bound potential risk is determined by combining the estimated potential health risk from each of the COPCs. Potential carcinogenic effects are added unless evidence exists indicating that the COPCs interact synergistically (a combined effect that is greater than a simple addition of potential individual effects) or antagonistically (a combined effect that is less than a simple addition of potential individual effects) with each other. For noncarcinogenic effects, USEPA guidance indicates that HQs should only be summed to an HI for COPCs that have the same or similar toxic endpoints (USEPA, 1989). The toxic endpoint is defined as the most sensitive noncarcinogenic health effect used to derive the RfD/RfC or other suitable toxicity value (USEPA, 1989). For screening purposes in this HHRA, the HIs were calculated by summing the HQs for all COPCs, regardless of target endpoint, as a first approximation of noncarcinogenic risk. Target organ-specific HIs were calculated only for those scenarios in which the total HI based on the combined target endpoints

were greater than 1 (i.e., the hypothetical future resident scenario). The total potential HIs presented based on the combined target endpoints provide an over-estimation of potential HI.

Based on USEPA guidance, the goal of an HHRA is to estimate an upper-bound, but reasonable, potential exposure and ELCR/HI. Most of the assumptions about exposure and toxicity used in this evaluation are representative of statistical upper-bounds or even maximum levels for each parameter. The result of combining several such upper-bound assumptions is that the final estimate of potential exposure or potential ELCR/HI is conservative and likely overestimates rather than underestimates the potential ELCR/HI associated with a receptor's exposure to Project media.

4. Ecological Risk Assessment

The Ecological Risk Assessment (ERA) was conducted to evaluate the potential for adverse environmental effects due to exposures to chemicals in soil, hydric soil, porewater, sediment, and surface water within the Project and/or adjacent off-Project areas, and to determine whether chemicals in these areas pose an unacceptable risk to the environment.

The ERA was conducted in accordance with USEPA guidelines for ecological risk assessment under CERCLA (USEPA, 1997b) and is based on the following key guidance documents:

- Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessment, Interim Final. (USEPA, 1997b);
- Guidelines for Ecological Risk Assessment (USEPA, 1998);
- The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments (USEPA, 2001); and
- A Guide to Screening Level Ecological Risk Assessment (Tri-Services Environmental Risk Assessment Work Group [TSERAWG], 2008).

The ERA includes a screening level ERA (SLERA), which is considered the first tier of the ecological risk process (i.e., Steps 1 and 2 of the USEPA eight-step process for ERA [USEPA, 1997b]). Conducting a SLERA is consistent with a tiered approach to ecological risk assessment recommended by USEPA (1997b, 1998, and 2001). Conducting assessments in a tiered, step-wise manner allows the risk assessor and risk manager to maximize the use of available Project information and sampling data, and provides the opportunity to reduce the uncertainties inherent in the ecological risk assessment process through the use of focused supplemental data collection to fill key data gaps identified in the previous tier of the assessment, if necessary.

The SLERA is designed as a conservative assessment (e.g., maximum media concentrations, conservative benchmarks) to avoid eliminating a COPC that may pose a risk to sensitive ecological receptors. At the end of Step 2 of the SLERA, a scientific/management decision point (SMDP) is reached when a conclusion can be made that either (1) the available data indicate the potential for ecological risk and further investigation is warranted, (2) the available data indicate either no or low potential for ecological risk and no further work is warranted, or (3) there are data gaps that must be addressed before the presence or absence of risk can be concluded (e.g., additional sampling or analysis). SMDPs occur at several key points in the eight-step process and are used by the risk assessor and risk manager to determine if the process should continue, and if enough data have been evaluated to determine the outcome of the ERA.

In cases where the SLERA indicates sufficient potential ecological risk, further ecological risk assessment may be warranted in a second-tier analysis referred to as the baseline ERA (BERA) (i.e., Steps 3 through 8 of the USEPA eight-step process).

This ERA includes a SLERA performed according to USEPA's eight-step ERA process (USEPA, 1997) in which COPCs identified in Steps 1 and 2 are retained for further investigation for specific receptors/pathways. The list of COPCs was refined consistent with the initial stage of a BERA, referred to as Step 3a, to reduce uncertainty in the SLERA Step 1 and 2 conclusions and to refine the SMDP recommendations by applying more realistic exposure assumptions. The results of the SLERA and BERA Step 3a COPC refinement are provided in this document.

4.1 Organization of the ERA

This ERA is organized into three major sections, as suggested by USEPA's Framework for Ecological Risk Assessment (USEPA, 1992); these sections are Problem Formulation (Section 4.2), Risk Analysis (Section 4.3), and Risk Characterization (Section 4.4). The SLERA conclusions and SMDP are provided in Section 4.5 and the Step 3a refinement of COPCS is presented in Section 4.6. An overview of each of these sections is provided below:

- Screening Level Problem Formulation - This section describes the environmental setting and chemicals at the Site, including Site history, types of waste found at the Site, chemical fate and transport, potential receptors and

potentially complete exposure pathways. Assessment endpoints and measurement endpoints are defined. The final product of the Screening Level Problem Formulation is the ecological CSM which defines potential exposure pathways at the Site.

- Screening Level Risk Analysis – During the risk analysis phase, data are evaluated to identify COPCs and characterize potential ecological exposures and effects.
- Screening Level Risk Characterization - During risk characterization, exposure and stressor response profiles are integrated through risk estimation. Risk characterization also includes a summary of uncertainties, strengths, and weaknesses associated with the risk assessment.
- SLERA Conclusions - This section presents a summary of the SLERA and provides recommendations for the SMDP.
- Step 3 COPC Refinement – This section further evaluates the COPCs identified in the screening level process by considering alternate EPCs and ESVs and evaluating additional data related to the bioavailability of COPCs in sediment.

The risk assessment process is frequently iterative, and new information brought forth during the exposure estimate, for instance, may lead to a review of the problem formulation phase, or additional data collection and analysis.

4.2 Screening Level Problem Formulation

Problem formulation is the initial systematic planning phase of the ecological risk assessment process. It provides the basis for the approach and methodology to be used as well as defining the specific scope and objectives of the risk evaluation. This section describes the physical setting and ecological habitats found in the vicinity of the Project. This section also summarizes the potentially complete exposure pathways and relevant ecological receptors, develops the CSM, and identifies the ecological screening values used to evaluate the analytical data.

4.2.1 Ecological Setting

The Blue Beach Disposal Site, located in North Kingstown, Rhode Island (Washington County), is a 13-acre property. The northern portion of the Property is used as a salvage/material storage yard and the southern portion of the Project is in commercial/industrial use. It is bordered by industrial land uses and roadways to the north, east and west sides. Also, on the west side of the Project is the Red Maple Swamp into which a drainage channel flows from the north. Narragansett Bay borders the Project to the south. The drainage channel is connected to the bay, particularly at high tides, forming a tidal stream. There is a concrete seawall located along most of the southern boundary of the Project.

The focus of the SLERA is on three exposure areas of the Project defined in Section 2.0 (**Figure 2-2**), as follows:

- On-Project Blue Beach – the area within the jurisdictional Blue Beach FUDS boundary
- Off-Project Red Maple Swamp/tidal stream area– the area within the Red Maple Swamp including the associated tidal stream, “Red Maple Swamp”, and the walking path from Circuit Drive to Blue Beach
- Off-Project Narragansett Bay and Beachfront area

A Site visit was conducted by AECOM in August 2011 and photographs taken during this visit are presented in **Attachment F**. Maintained lawn areas are present around the building to the west before transitioning to forested habitat and the Red Maple Swamp and to the south before transitioning to a mix of grasses and shrubs along the beach front (**Figure 4-1** presents the forest and wetland resources of the off-Project Red Maple Swamp area).

The turf area of the on-Project Blue Beach area is approximately 3.5 acres in size including a small area (approximately 0.5 acres) to the north of the parking lot area and south of Circuit Drive and a larger area to the west and south of the buildings (approximately 3 acres).Surrounding land uses include commercial to the north and east. The Blue Beach Walking Path runs north to south from Circuit Drive to the beachfront in between the on-Project Blue Beach area and the off-Project Red Maple Swamp/tidal stream area. The presence of this walking path may diminish the habitat value of the beach for shorebirds such as red knot (*Calidris canutus*), a Federally-listed (Threatened) sandpiper species, due to the presence of recreational beach use.

The Red Maple Swamp includes an open area of estuary grasses and low shrubs (approximately 4 acres) with a tidally-influenced stream surrounded by a forest (approximately 3 acres) on three sides and the shoreline of Narragansett Bay to the south. Dominant species of the open wetland habitat include *Phragmites australis* (a non-native, invasive species), *Spartina alterniflora*, and *S. patens* and in the forested area and red maple (*Acer rubrum*) along the forested fringes where freshwater discharge is expected. The open wetland area continues to the west/southwest of the Red Maple Swamp area. The Red Maple Swamp is bordered to the north and west by residential properties. To the north of the open wetland area is a commercial property and a drainage retention pond borders (to the west) the forested section closest to Circuit Drive.

Due to the current industrial and commercial land uses and maintenance (e.g., mowing) of the on-Project Blue Beach area, this upland area likely provides limited ecological habitat functions. The presence of mammals and birds are likely limited due to the lack of habitat diversity and structure such as shrubs and trees. The habitat quality of the off-Project Red Maple Swamp/tidal stream area appears to be in better condition with areas of open water, a tidally-influenced stream channel, and forested swamp habitats present. This area likely provides beneficial ecological functions to aquatic and semi-aquatic animals including amphibians, fish, and semi-aquatic birds and mammals. The beachfront habitat provides limited ecological function due to stone bank revetments; however, areas of “natural” beachfront are also present. As a result, this area also provides some ecological functions to aquatic and semi-aquatic mammals as well as shorebirds.

4.2.2 Selection of Specific Ecological Receptors and Receptor Pathways

Ecological receptors are the components of ecosystems (i.e., species or sensitive habitats) that are or may be adversely affected by a chemical, physical, or biological stressor. Receptors can be any part of an ecological system, including species, populations, communities, and the ecosystem itself. The SLERA is focused on the pathways for which the potential for chemical exposures are the highest and most likely to occur and for which there are adequate data pertaining to the receptors, exposure pathways, and toxicity for completion of risk analyses.

Exposure pathways for several groups of ecological receptors were identified as potentially relevant. Each exposure pathway includes a potential source of a chemical, an environmental medium (e.g., surface soil, sediment, surface water, porewater), and a potential exposure route to an ecological receptor. Incomplete routes of exposure were not evaluated in the SLERA. This approach is used to focus the risk evaluation on exposure pathways that are considered potentially complete and for which there are adequate data pertaining to the receptors, exposure, and toxicity for completion of the risk analysis.

Exposure pathways for several groups of ecological receptors were identified as potentially relevant. In addition, the SLERA evaluated:

- Soil invertebrates and terrestrial plants directly exposed to surface soil in the on-Project Blue Beach area.
- Birds and small mammals exposed through incidental ingestion of surface soil and/or by ingestion of prey items impacted by surface soil in in the on-Project Blue Beach area.
- Benthic invertebrates/shellfish exposed to surface sediment and/or porewater associated with the tidal stream in the off-Project Red Maple Swamp/tidal stream area and the off-Project Narragansett Bay and Beachfront area;
- Fish and aquatic invertebrates exposed to surface water associated with the tidal stream in the off-Project Red Maple Swamp/tidal marsh and the off-Project Narragansett Bay and Beachfront area;
- Soil invertebrates and plants exposed to soil and hydric soil in the off-Project Red Maple Swamp/tidal stream area; and
- Birds and mammals exposed through incidental ingestion of surface soil, hydric soil, sediment, and/or by ingestion of prey items impacted by surface soil, hydric soil, and/or sediment in the off-Project Red Maple Swamp/tidal stream area.

4.2.3 Selection of Assessment Endpoints and Measures of Effect

Assessment endpoints are formal expressions of the actual environmental value to be protected (USEPA, 1998). They usually describe potential adverse effects to long-term persistence, abundance, or reproduction of populations of key species or key habitats. Measures of effect (i.e., measurement endpoints) are quantifiable ecological

characteristics related to the assessment endpoint. Measurement endpoints are often stressor-specific and are used to evaluate the assessment endpoint with respect to potential ecological risks. The endpoints evaluated in this SLERA are presented below.

Assessment Endpoint	Measurement Endpoint(s)
On-Project Blue Beach Area	
Sustainability (survival, growth, reproduction) of local populations of soil invertebrates and plants exposed to surface soils associated with the on-Project Blue Beach area.	Comparison of surface soil concentrations from the On-Project Blue Beach area against soil screening benchmarks that are protective of soil invertebrates and plants.
Sustainability (survival, growth, reproduction) of local populations of small mammals and birds exposed to surface soils and food items associated with the on-Project Blue Beach area.	Comparison of calculated total daily dose (TDD) for avian and mammalian receptors from exposure to chemicals in soil and/or ingestion of prey items to chemical-specific toxicity reference values (TRVs). Doses above the TRVs are considered indicative of a potential for ecological risks.
Off-Project Red Maple Swamp/Tidal Stream Area	
Sustainability (survival, growth, reproduction) of local populations of soil invertebrates and plants exposed to soil and hydric soil associated with the off-Project Red Maple Swamp/tidal stream area.	Comparison of surface soil and surface hydric soil concentrations from the off-Project Red Maple Swamp/tidal stream area against soil screening benchmarks that are protective of soil invertebrates and plants.
Sustainability (survival, growth, reproduction) of local populations of small mammals and birds exposed to soil, hydric soil, and sediment associated with the off-Project Red Maple Swamp/tidal stream area.	Comparison of calculated TDD for avian and mammalian receptors from exposure to chemicals in soil, hydric soil, sediment and/or ingestion of prey items to chemical-specific TRVs. Doses above the TRVs are considered indicative of a potential for ecological risks.
Sustainability (survival, growth, reproduction) of local populations of benthic invertebrates/shellfish exposed to sediment associated with the tidal stream in the off-Project Red Maple Swamp/tidal stream area.	Comparison of surface sediment concentrations from the tidal stream in the off-Project Red Maple Swamp/tidal stream area against benthic invertebrate-based sediment screening benchmarks identified in the literature.
	Comparison of surface water and porewater concentrations from the tidal stream in the off-Project Red Maple Swamp/tidal stream area, against aquatic life-based surface water screening benchmarks identified in the literature.
Sustainability (survival, growth, reproduction) of local populations of fish and aquatic invertebrates exposed to surface water associated with the tidal stream in the off-Project Red Maple Swamp/tidal stream area.	Comparison of surface water concentrations from the tidal stream in the off-Project Red Maple Swamp/tidal stream area against aquatic life-based surface water screening benchmarks identified in the literature.
Off-Project Narragansett Bay and Beachfront Area	
Sustainability (survival, growth, reproduction) of local populations of benthic invertebrates/shellfish exposed to sediment associated with the tidal stream in the off-Project Narragansett Bay and Beachfront area.	Comparison of surface sediment concentrations from the off-Project Narragansett Bay and Beachfront area against benthic invertebrate-based sediment screening benchmarks identified in the literature.
	Comparison of surface water and porewater concentrations from the off-Project Narragansett Bay and Beachfront area against aquatic life-based surface water screening benchmarks identified in the literature.
Sustainability (survival, growth, reproduction) of local populations of fish and aquatic invertebrates exposed to surface water associated with the off-Project Narragansett Bay.	Comparison of surface water concentrations and porewater from the off-Project Narragansett Bay against aquatic life-based surface water screening benchmarks identified in the literature.

4.2.4 Ecological Conceptual Site Model

The end product of the problem formulation step is the development of the ecological CSM. The ecological CSM summarizes the current knowledge of the Project and ecological resources potentially at risk. The ecological CSM is a set of working hypotheses regarding how ecological receptors at the Project may be exposed to chemicals.

The ecological CSM is included as **Figure 4-2**. The CSM displays the exposure pathways through which groups of ecological receptors may be exposed to COPCs in each environmental medium at the Project. The objective of the CSM is to identify the ecologically important exposure and migration pathways, and to specify exposure scenarios evaluated in the SLERA.

Sources of chemicals of potential concern at the Project are considered to be related to historical activities. Past operations may have resulted in direct releases of chemicals to soil based on its former use as a salvage yard for the storage and disposal of vehicle parts, machinery, construction debris, drummed materials, and miscellaneous wastes. Chemicals in soil may have migrated downward into subsurface soil and ultimately to groundwater. Dissolved chemicals in groundwater may have discharged to downgradient to the tidal streams and to Narragansett Bay.

Based on available information, the media of interest for the SLERA were:

- Surface soil (0-1 ft bgs);
- Surface hydric soil (0-1 ft bgs);
- Surface sediment (0-0.5 ft bgs);
- Surface water; and
- Porewater.

As described in Section 4.2.2, potentially exposed receptor communities include soil invertebrates, plants, benthic invertebrates/shellfish, fish and aquatic invertebrates, small mammals and birds. The assessment and measurement endpoints described in Section 4.2.3 address each ecological receptor/pathway scenario identified in **Figure 4-2**.

4.3 Screening Level Risk Analysis

The risk analysis phase of the SLERA is based on the CSM developed in problem formulation and addresses the characterization of potential ecological exposure and corresponding effects. The ecological exposure assessment involves the identification of potential exposure pathways and an evaluation of the magnitude of exposure to ecological receptors. The ecological effects assessment describes the potential adverse effects to ecological receptors from exposure to COPCs in environmental media.

4.3.1 Data Evaluation and Identification of COPCs

Analytical data were grouped for evaluation in the SLERA, as discussed in Section 2.1. Consistent with the HHRA COPC selection process, COPCs were selected for the SLERA based on a comparison of the maximum detected concentrations of each chemical detected in discrete samples per media/area/depth interval (as applicable) to ecological screening values (ESVs). For PCBs analyzed from ISM surface soil samples collected from the on-Project Blue Beach area, the highest of the SU-specific 95% UCLs (as described in Section 2.2.4.2 and shown in **Attachment C**) was used in the SLERA instead of the maximum detected concentration (the 95% UCL is higher than the maximum detected concentration of the ISM samples). The ESVs are included in **Tables 4-1 through 4-3** and were identified based on conservative endpoints and sensitive ecological effects data and they were used for a preliminary screening of surface soil, surface water and sediment concentrations.

Chemicals detected at concentrations above the ESVs were identified as preliminary COPCs for further evaluation in comparison with background, as discussed in Section 2.3. The COPC selection process may consider low FOD, low toxicity and low concentration, consistency with Site-specific background, essential nutrient status, and whether the chemical is likely to be present due to laboratory contamination. Essential nutrients, including magnesium, calcium, potassium, and sodium were not retained as COPCs for further evaluation in the SLERA, consistent with USEPA guidance (USEPA, 1989). A chemical was not retained as a COPC if it was consistent with background based on the BTV comparison, two-sample hypothesis test comparisons, qualitative/graphical background comparisons, or the geochemical analysis.

4.3.2 Ecological Effects Assessment

Receptor- and media-specific ESVs were selected to identify ecological COPCs and evaluate the potential for ecological risks from the Project. These ESVs were used to conduct a preliminary screening of Project constituent concentrations to determine if there is a need to conduct further analyses or investigations at the Project.

Literature-derived soil ESVs are presented in **Table 4-1** and were selected to evaluate potential impacts to soil invertebrates and plants exposed to soil and hydric soil using the following hierarchy:

- Ecological Soil Screening Levels (Eco-SSLs) for plants and invertebrates developed according to USEPA guidance (USEPA, 2005b);
- Oak Ridge National Laboratory (ORNL) terrestrial plant and invertebrate (earthworm) screening values (Efroymson, et al., 1997a, 1997b). Values for soil microorganisms and microbial processes (Efroymson et al., 1997b) were selected in cases when earthworm based values are not available;
- Dutch Intervention Values and Target Values (RIVM, 1994, 1995, 2000) as cited in Buchman (2008).
- USEPA Region 4 soil screening levels (USEPA, 2018a); and
- USEPA Region 5 Ecological Screening Levels for soil (USEPA, 2003c).

The Eco-SSLs for birds and mammals were used to evaluate potential risks to higher trophic-level wildlife receptors exposed to surface soil chemicals. If wildlife Eco-SSLs were not available, wildlife-based values available from USEPA Region 4 (USEPA, 2018a) or Region 5 (USEPA, 2003c) were identified if available. The lowest of the ESVs for plants, invertebrates, and wildlife were used to select COPCs.

Sediment analytical chemistry analysis results were compared to low effect risk-based sediment ESVs presented in **Table 4-2**. Sources for sediment screening values were considered in this order:

- USEPA Region III Biological Technical Assistance Group (BTAG) freshwater and marine sediment screening values (USEPA, 2006a,b);
- National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Table (Buchman, 2008)

Marine sediment values were identified, when available, for the off-Project Narragansett Bay and Beachfront area. If marine values were not available, then freshwater screening values were selected from the above hierarchy. For the off-Project Red Maple Swamp/tidal stream area, the lower of available freshwater and marine ESVs were selected.

Surface water and porewater analytical chemistry analysis results were compared to risk-based surface water ESVs presented in **Table 4-3**. Sources for surface water ESVs were considered in this order:

- Chronic federal Ambient Water Quality Criteria (AWQC) for aquatic life (USEPA, 2020);
- USEPA Region III BTAG surface water screening values (USEPA, 2006c,d); and
- Secondary Chronic Values derived by the Oak Ridge National Laboratory (ORNL) (Suter and Tsao, 1996).

Marine surface water ESVs were selected preferentially for the off-Project Narragansett Bay and Beachfront area. If marine values were not available, then freshwater screening values were selected from the above hierarchy. For the off-Project Red Maple Swamp/tidal stream area, the lower of available freshwater and marine ESVs were selected to account for the estuarine nature of the system. Hardness-dependent freshwater surface water screening values were adjusted to the average hardness of 183 mg/L as $CaCO_3$ measured in Red Maple Swamp surface water.

Risks to mammals and birds from exposure to chemicals in surface soil and hydric soil/sediment were evaluated using food web models to estimate the TDD which was compared to TRVs representing acceptable daily doses in mg/kg-day. Detected chemicals were evaluated using a food web model if the chemical is identified as an ‘important bioaccumulative compound’ by USEPA (USEPA, 2000).

TRVs incorporated into the quantitative evaluation of potential ecological risks to wildlife were obtained from the following sources: TRVs derived according to USEPA guidance (USEPA, 2005) during the development of Eco-SSLs, ORNL publication Toxicological Benchmarks for Wildlife: 1996 Revision (Sample et al,. 1996), and the LANL EcoRisk Database (LANL, 2017). When TRVs were not derived in these documents, the literature was reviewed for relevant

data and TRVs were derived using the methodology of ORNL (Sample et al., 1996). TRVs used in the SLERA are based on No Observed Adverse Effect Levels (NOAELs).

4.3.3 Ecological Exposure Assessment

The second step of the SLERA is the screening level exposure estimate and risk calculation in which risks are estimated by comparing maximum detected concentrations with associated ESVs. Maximum detected concentrations were identified by exposure area and medium.

Tables 4-4 through 4-11 identify detected chemical and provide ESV comparisons, as well as the results of relevant background comparisons (i.e., comparisons to BTVs, two-sample hypothesis test comparisons, geochemical analysis).

For the food web model, exposure assumptions (e.g., body weights, relative consumption of food items, foraging range, exposure duration, etc.) for wildlife species were obtained from the USEPA's Wildlife Exposure Factors Handbook (USEPA, 1993c). Allometric equations (Nagy, 2001) were used to estimate food ingestion rates. Separate screening level food web models were conducted for the on-Project Blue Beach area (surface soil) and the off-Project Red Maple Swamp/tidal stream area (combined data set of surface soil, hydric soil, and sediment data).

Wildlife receptors evaluated in the food web model include:

- American robin - insectivore foraging in the on-Project Blue Beach area;
- Marsh wren - insectivore foraging in the off-Project Red Maple Swamp/tidal stream area;
- Bobwhite quail - herbivore foraging in the on-Project Blue Beach area;
- Raccoon – omnivore foraging in the on-Project Blue Beach area and in the off-Project Red Maple Swamp/tidal stream area;
- Meadow vole - herbivore foraging in the on-Project Blue Beach area and in the off-Project Red Maple Swamp/tidal stream area; and
- Short-tailed shrew - insectivore foraging in the on-Project Blue Beach area and in the off-Project Red Maple Swamp/tidal stream area.

Chemical concentrations in food items were calculated using bioaccumulation factors (BAFs) and other uptake factors from published sources or regression equations from the USEPA Eco-SSL Guidance (USEPA, 2007b) and other literature sources (e.g., Bechtel Jacobs, 1998a,b). The USEPA's Biota-Sediment Accumulation Factor (BSAF) database was used as a primary source to identify sediment-to-invertebrate uptake factors for organic chemicals. Soil-based uptake factors were used for sediment/hydric soil when sediment uptake factors were not available.

The on-Project Blue Beach area food web model (**Attachment G-1**) evaluated the potential for risks to birds and mammals due to exposure to bioaccumulative chemicals detected in surface soil. With the exception of Total PCBs, the maximum detected surface soil concentrations were considered in this model. As described in Section 4.3.1, the highest SU-specific 95% UCL was used in the SLERA instead of the maximum detected concentration for PCBs collected via ISM (the 95% UCL is higher than the maximum detected concentration of the ISM samples).

The food web model for the off-Project Red Maple Swamp/tidal stream area (**Attachment G-2**) considered the potential for wildlife exposures to surface soil associated with the walking path, hydric soil associated with the Red Maple Swamp, and sediment associated with the tidal stream. The maximum detected concentrations of bioaccumulative chemicals detected in these three media were considered in this model.

The results of the on-Project and off-Project food web models are summarized in **Tables 4-12 and 4-13**, respectively.

4.3.4 SLERA Risk Calculations

HQs were calculated for each COPC in each medium (i.e., surface soil, hydric soil, surface sediment, surface water, porewater) by dividing the maximum detected concentration (or 95% UCL for Total PCB data collected via ISM) by the relevant ESV using the following formula:

$$HQ = \text{Maximum detected concentration} / ESV$$

For higher trophic level wildlife receptors (i.e., birds and mammals evaluated in the food web models), the risk estimate is also based on the HQ, defined as the ingested dose divided by the species-specific TRV:

$$HQ = TDD/TRV$$

Analytes which exceed their respective screening benchmarks (i.e., HQs > 1) and analytes without screening benchmarks were retained as preliminary COPCs. Essential nutrients (calcium, magnesium, potassium, and sodium) were not retained as COPCs. Preliminary COPCs were evaluated as described in Section 2.3 to determine whether concentrations in exposure areas are consistent with background. Preliminary COPCs were retained as final COPCs if they are not consistent with background.

4.4 Screening Level Risk Characterization

Risk characterization provides a quantitative evaluation of the potential for adverse ecological impacts due to COPCs in an area of concern. The results of the environmental risk analysis are used to quantify the potential adverse environmental effects, or to determine whether a conclusion of no significant risk can be reached for each assessment endpoint evaluated. This ecological risk characterization summarizes the results of the risk analysis phase of work and provides an interpretation of the ecological significance findings. Aspects of ecological significance that have been considered to help place the Project into a broader ecological context include the nature and magnitude of effects.

The presence of COPCs in environmental media at concentrations which exceed ecological screening values does not necessarily constitute ecological risk. For instance, certain COPCs may not be absorbed into an organism's system following ingestion or may not be absorbed through direct contact due to the chemical form of the COPCs. The decision concerning the necessity for further evaluation requires the weighing of such factors as the frequency, magnitude, and pattern of these exceedances. These factors were considered in the uncertainty analysis described in Section 4.4.4.

4.4.1 On-Project Blue Beach Area Risk Characterization

Table 4-4 identifies the COPCs in soil selected based on ESV comparisons for the on-Project Blue Beach area surface soils. The table below identifies the preliminary surface soil COPCs identified based on a maximum detected concentration above the lowest soil ESV identified in **Table 4-1** or a lack of an ESV. Shading in the table below identifies the COPCs retained after the background comparisons and the HQs calculated from the maximum detected concentration are provided for these COPCs.

On-Project Blue Beach Surface Soil COPC Selection		
Preliminary COPC	**Eliminated as a COPC Based On -**	**Maximum HQ for Retained COPC**
Aluminum	BTV	NCOPC
Antimony	**--**	**11.6**
Cadmium	**--**	**33.3**
Chromium	Hypothesis testing	NCOPC
Cobalt	Hypothesis testing	NCOPC
Copper	**--**	**4.1**
Iron	BTV	NCOPC
Lead	**--**	**34.8**
Manganese	Hypothesis testing	NCOPC
Mercury	Hypothesis testing	NCOPC
Nickel	Hypothesis testing	NCOPC
Silver	Hypothesis testing	NCOPC
Vanadium	BTV	NCOPC
Zinc	**--**	**9.2**
Total PCB Aroclors	**NE**	**24.0**
Anthracene	Hypothesis testing	NCOPC
Dibenzo(a,h)anthracene	[a]	NCOPC
Total HMW PAHs	Hypothesis testing	NCOPC

On-Project Blue Beach Surface Soil COPC Selection		
Preliminary COPC	**Eliminated as a COPC Based On -**	**Maximum HQ for Retained COPC**
Benzoic acid	**NE**	**500**
Bis-(2-Ethylhexyl)-Phthalate	**NE**	**43.0**
Acetone	**NE**	**9.8**

Notes:
Shading identifies COPCs retained after background comparisons.
Maximum HQ = Maximum detected concentration / COPC selection ESV.
NCOPC – Not a COPC.
NE – Not evaluated in background comparisons because they were not part of background study.
[a] Although dibenzo(a,h)anthracene was initially retained based on the ESV and background comparisons, it was not retained as a COPC. Due to the additive toxicity of PAHs, PAHs were only retained as COPCs based on the Total HMW or LMW PAH evaluations. Total HMW PAHs were not retained in this evaluation based on the two-sample hypothesis conclusion that Site is less than or equal to background. Total LMW PAHs were not retained in this evaluation because the maximum detected concentration is less than the ESV. Therefore, PAHs were not further evaluated in on-Project Blue Beach area surface soil.

HQs calculated based on the maximum concentration detected for each of the COPCs retained in the on-Project Blue Beach area surface soil ranged from 4.1 for copper to 500 for benzoic acid (based on a single detected concentration in 26 samples). Given that COPCs were selected based on the lowest of the ESVs for plants, invertebrates, and wildlife, and that the HQs were calculated from the highest concentration of analyte detected, except for PCBs which were calculated from the higher 95% UCL, these HQs represent a conservative estimate of potential risks.

Table 4-12 identifies the food web COPCs identified based on the on-Project Blue Beach screening level food web model. The food web model evaluated maximum detected surface soil concentrations for bioaccumulative chemicals (USEPA, 2000), which included selected metals, Total HMW and LMW PAHs, and Total PCBs. Wildlife receptors evaluated in the food web model included two herbivores (bobwhite quail and meadow vole), two insectivores (American robin and short-tailed shrew), and one omnivore (raccoon).

COPCs were retained for further food web evaluations if NOAEL-based HQs were above 1 and the COPC was not consistent with background. Arsenic and selenium were eliminated as food web COPCs based on comparisons to BTVs and chromium, mercury, nickel, silver, and Total HMW PAHs were eliminated based on hypothesis testing. HQs for Total LMW PAHs were less than one. The table below summarizes the HQs above 1 for the wildlife receptors and the retained food web COPCs.

On-Project Blue Beach Food Web COPCs with HQs > 1			
Food Web COPC	**American Robin**	**Raccoon**	**Short-tailed Shrew**
Cadmium	**6.1**	**1.3**	**10.1**
Copper	**2.5**	HQ < 1	**1.4**
Lead	**11.1**	HQ < 1	**2.8**
Zinc	**1.5**	HQ < 1	**1.1**
Total PCB Aroclors	**2.7**	HQ < 1	**6.1**

Notes:
Shading identifies HQs > 1 for food web COPCs retained after background comparisons.
No HQs above 1 were identified for the herbivores (bobwhite quail and meadow vole).

HQs for the on-Project Blue Beach area food web COPCs were highest for the insectivores and ranged up to 11.1 for the American robin for lead and 10.1 for short-tailed shrew for cadmium.

4.4.2 Off-Project Red Maple Swamp/Tidal Stream Area Risk Characterization

4.4.2.1 Surface Soil

Table 4-5 identifies the soil COPCs selected based on ESV comparisons for the surface soil associated with the walking path in the off-Project Red Maple Swamp/tidal stream area. The table below identifies the preliminary surface soil COPCs identified based on a maximum detected concentration above the lowest soil ESV identified in **Table 4-1** or a lack of an ESV. Shading in the table below identifies the COPCs retained after the background comparisons and maximum HQs are provided for these COPCs.

Off-Project Red Maple Swamp/Tidal Stream Surface Soil COPC Selection		
Preliminary COPC	**Eliminated as a COPC Based On -**	**Maximum HQ for Retained COPC**
Aluminum	BTV	NCOPC
Chromium	Hypothesis testing	NCOPC
Cobalt	BTV	NCOPC
Iron	BTV	NCOPC
Lead	Hypothesis testing	NCOPC
Mercury	BTV	NCOPC
Vanadium	BTV	NCOPC
Zinc	Hypothesis testing	NCOPC
Aroclor 1260	[a]	NCOPC
Total PCB Aroclors	**NE**	**12.5**
Anthracene	Hypothesis testing	NCOPC
Benzo(a)anthracene	Hypothesis testing	NCOPC
Benzo(a)pyrene	Hypothesis testing	NCOPC
Benzo(b)fluoranthene	Hypothesis testing	NCOPC
Benzo(g,h,i)perylene	Hypothesis testing	NCOPC
Chrysene	Hypothesis testing	NCOPC
Dibenzo(a,h)anthracene	Hypothesis testing	NCOPC
Indeno(1,2,3-cd)pyrene	Hypothesis testing	NCOPC
Pyrene	Hypothesis testing	NCOPC
Total HMW PAHs	Hypothesis testing	NCOPC

Notes:
Shading identifies COPCs retained after background comparisons.
Maximum HQ = Maximum detected concentration / COPC selection ESV.
NCOPC – Not a COPC.
NE – Not evaluated in background comparisons because they were not part of background study.
[a] Although Aroclor 1260 was initially retained based on the ESV comparisons, it was not retained as a COPC. Due to the additive toxicity of PCBs, PCBs were only retained as COPCs based on the Total PCB evaluation. Total PCBs were retained as a COPC so the evaluation of Total PCBs captures potential impacts associated with Aroclor 1260.

Total PCBs were the only surface soil COPC identified in **Table 4-5**. The HQ of 12.5 was based on the comparison to the conservative Dutch ESV presented by Buchman (2008).

4.4.2.2 Surface Hydric Soil

Table 4-6 identifies the hydric soil COPCs selected based on ESV comparisons for the surface hydric soil associated with off-Project Red Maple Swamp. The table below identifies the preliminary surface hydric soil COPCs identified based on a maximum detected concentration above the lowest soil ESV identified in **Table 4-1** or a lack of an ESV. Shading in the table below identifies the COPCs retained after the background comparisons and the HQs calculated from the maximum concentrations (and 95% UCL for PCBs) are provided for these COPCs.

Off-Project Red Maple Swamp/Tidal Stream Surface Hydric Soil COPC Selection		
Preliminary COPC	**Eliminated as a COPC Based On -**	**Maximum HQ for Retained COPC**
Aluminum	Geochemical analysis	NCOPC
Antimony	**--**	**4.3**
Cadmium	**--**	**6.6**
Chromium	Geochemical analysis	NCOPC
Cobalt	Geochemical analysis	NCOPC
Copper	**--**	**1.6**
Iron	Geochemical analysis	NCOPC
Lead	**--**	**25.2**
Mercury	**--**	**16.2**
Selenium	**--**	**9.4**
Thallium	**--**	**1.2**
Vanadium	Geochemical analysis	NCOPC

Off-Project Red Maple Swamp/Tidal Stream Surface Hydric Soil COPC Selection		
Preliminary COPC	**Eliminated as a COPC Based On -**	**Maximum HQ for Retained COPC**
Zinc	Geochemical analysis	NCOPC
Aroclor 1260	[a]	NCOPC
Total PCB Aroclors	**NE**	**115**
1-Methylnaphthalene	[b]	NCOPC
2-Methylnaphthalene	[b]	NCOPC
Anthracene	Hypothesis testing	NCOPC
Benzo(a)anthracene	Hypothesis testing	NCOPC
Benzo(a)pyrene	[b]	NCOPC
Benzo(b)fluoranthene	[b]	NCOPC
Benzo(g,h,i)perylene	Hypothesis testing	NCOPC
Benzo(k)fluoranthene	Hypothesis testing	NCOPC
Chrysene	Hypothesis testing	NCOPC
Dibenzo(a,h)anthracene	[b]	NCOPC
Indeno(1,2,3-cd)pyrene	[b]	NCOPC
Naphthalene	[b]	NCOPC
Pyrene	Hypothesis testing	NCOPC
Total HMW PAHs	Hypothesis testing	NCOPC
2,4-Dichlorophenol	**NE**	**180**
Acetone	**NE**	**107**
Carbon Disulfide	**NE**	**3.7**
Toluene	**NE**	**7.2**

Notes:
Shading identifies COPCs retained after background comparisons.
Maximum HQ = Maximum detected concentration / COPC selection ESV.
NCOPC – Not a COPC.
NE – Not evaluated in background comparisons because they were not part of background study.
[a] Although Aroclor 1260 was initially retained based on the ESV comparisons, it was not retained as a COPC. Due to the additive toxicity of PCBs, PCBs were only retained as COPCs based on the Total PCB evaluation. Total PCBs were retained as a COPC so the evaluation of Total PCBs captures potential impacts associated with Aroclor 1260.
[b] Individual PAHs were not retained as COPCs. Due to the additive toxicity of PAHs, PAHs were only retained as COPCs based on the Total HMW or LMW PAH evaluations. Total HMW PAHs were not retained in this evaluation based on the two-sample hypothesis conclusion that Site is less than or equal to background. Total LMW PAHs were not retained in this evaluation because the maximum detected concentration is less than the ESV. Therefore, PAHs were not retained for further evaluation in hydric soil.

HQs for the COPCs retained in the off-Project Red Maple Swamp area surface hydric soil ranged from 1.2 for thallium to 180 for 2,4-dichloropenol. Given that COPCs were selected based on the lowest of the ESVs for plants, invertebrates, and wildlife, and were calculated from the highest concentrations detected, these HQs represent a conservative estimate of potential risks.

4.4.2.3 Surface Sediment

Table 4-7 identifies the sediment COPCs selected based on ESV comparisons for the surface sediment associated with the tidal stream in the Off-Project Red Maple Swamp/tidal stream area. Samples were collected between outfall 025 and Narragansett Bay. Preliminary surface sediment COPCs are identified in the table below based on a maximum detected concentration above the sediment ESV for COPC selections (as shown in **Table 4-2**) or a lack of an ESV. Shading in the table identifies the COPCs retained after the background comparisons and maximum HQs are provided for these COPCs.

Off-Project Red Maple Swamp/Tidal Stream Surface Sediment COPC Selection		
Preliminary COPC	**Eliminated as a COPC Based On -**	**Maximum HQ for Retained COPC**
Aluminum	Hypothesis testing	NCOPC
Arsenic	Hypothesis testing	NCOPC
Barium	Hypothesis testing	NCOPC
Beryllium	Hypothesis testing	NCOPC

Off-Project Red Maple Swamp/Tidal Stream Surface Sediment COPC Selection		
Preliminary COPC	**Eliminated as a COPC Based On -**	**Maximum HQ for Retained COPC**
Cadmium	Geochemical analysis	NCOPC
Chromium	Hypothesis testing	NCOPC
Cobalt	Hypothesis testing	NCOPC
Copper	Hypothesis testing	NCOPC
Iron	Hypothesis testing	NCOPC
Lead	Hypothesis testing	NCOPC
Manganese	Hypothesis testing	NCOPC
Mercury	Hypothesis testing	NCOPC
Nickel	Hypothesis testing	NCOPC
Selenium	Hypothesis testing	NCOPC
Silver	Hypothesis testing	NCOPC
Thallium	Hypothesis testing	NCOPC
Vanadium	Hypothesis testing	NCOPC
Zinc	Geochemical evaluation	NCOPC
Aroclor 1260	[a]	NCOPC
Total PCB Aroclors	**NE**	**37.5**
1-Methylnaphthalene	[b]	NCOPC
2-Methylnaphthalene	[b]	NCOPC
Acenaphthene	BTV	NCOPC
Acenaphthylene	[b]	NCOPC
Anthracene	BTV	NCOPC
Benzo(a)anthracene	BTV	NCOPC
Benzo(a)pyrene	BTV	NCOPC
Benzo(b)fluoranthene	BTV	NCOPC
Benzo(g,h,i)perylene	BTV	NCOPC
Benzo(k)fluoranthene	BTV	NCOPC
Chrysene	BTV	NCOPC
Dibenzo(a,h)anthracene	BTV	NCOPC
Fluoranthene	BTV	NCOPC
Fluorene	Hypothesis testing	NCOPC
Indeno(1,2,3-cd)pyrene	BTV	NCOPC
Naphthalene [c]	[b]	NCOPC
Phenanthrene	BTV	NCOPC
Pyrene	BTV	NCOPC
Total High MW PAHs	BTV	NCOPC
Total Low MW PAHs	BTV	NCOPC
Total PAHs	BTV	NCOPC
Bis(2-ethylhexyl)phthalate	**NE**	**12.2**
Carbazole	BTV	NCOPC
2-Butanone (MEK)	**NE**	**NC**
Acetone	**NE**	**NC**
Carbon Disulfide	**NE**	**15.7**

Notes:
Shading identifies COPCs retained after background comparisons.
Maximum HQ = Maximum detected concentration / COPC selection ESV.
NCOPC – Not a COPC.
NC – Not Calculated (no ESV available).
NE – Not evaluated in background comparisons because they were not part of background study.
[a] Although Aroclor 1260 was initially retained based on the ESV comparisons, it was not retained as a COPC. Due to the additive toxicity of PCBs, PCBs were only retained as COPCs based on the Total PCB evaluation. Total PCBs were retained as a COPC so the evaluation of Total PCBs captures potential impacts associated with Aroclor 1260.
[b] Individual PAHs were not retained as COPCs. Due to the additive toxicity of PAHs, PAHs were only retained as COPCs based on the Total HMW or LMW PAH evaluations. Total HMW PAHs, Total LMW PAHs, and Total PAHs were not retained in this evaluation because the maximum detected concentrations were less than their respective

Off-Project Red Maple Swamp/Tidal Stream Surface Sediment COPC Selection		
Preliminary COPC	**Eliminated as a COPC Based On -**	**Maximum HQ for Retained COPC**

BTVs. Therefore, PAHs were not retained for further evaluation in sediment in the off-Project Red Maple Swamp/tidal stream area..
[c] Naphthalene was analyzed using both SVOC and VOC methods. Naphthalene was retained as a COPC based on the SVOC results, but not based on the VOC results.

HQs for the COPCs retained in the off-Project Red Maple Swamp area surface sediment ranged from 12.2 for bis(2-ethylhexyl)phthalate to 69 for Total PCBs. Sediment ESVs were not identified for 2-butanone and acetone so these chemicals were retained as COPCs, but HQs could not be calculated.

4.4.2.4 Surface Water and Porewater

Table 4-9 and 4-10 identify the surface water and porewater COPCs, respectively, for the off-Project Red Maple Swamp/tidal stream area. These COPCs were selected by comparing maximum surface water and porewater concentrations against surface water ESVs (as shown in **Table 4-3**). Background comparisons were not used to evaluate surface water or porewater COPCs. The table below identifies the surface water and porewater COPCs and provides the maximum HQs for these COPCs.

Off-Project Red Maple Swamp/Tidal Stream Surface Water and Porewater COPC Selection		
Medium	**COPC**	**Maximum HQ for Retained COPC**
Surface Water	**Barium - dissolved**	**4.1**
	Barium - total	**3.4**
	Carbon disulfide	**2.8**
Porewater	**Barium - dissolved**	**17.0**
	Lead - dissolved	**4.1**
	Barium – total	**16.8**
	Silver – total	**2.2**
	Carbon Disulfide	**1.2**
	Toluene	**1.4**

Notes:
Shading identifies COPCs retained after ESV comparisons.
Maximum HQ = Maximum detected concentration / COPC selection ESV.

In surface water and porewater, barium was detected in all samples in the off-Project Red Maple Swamp/tidal stream area and resulted in the highest HQs. The remaining COPCs were detected in fewer samples (FODs ranged from 4% to 26%).

4.4.2.5 Wildlife Exposures

Table 4-13 identifies the food web COPCs identified based on the off-Project Red Maple Swamp/tidal stream area screening level food web model (**Attachment G-2**). The food web model evaluated the maximum detected concentrations from the following off-Project datasets: surface soil from the off-Project Red Maple Swamp walking path, hydric surface soil from the off-Project Red Maple Swamp, and surface sediment from the off-Project tidal stream.

The off-Project food web considered the same set of bioaccumulative chemicals and followed the same general approach as the on-Project food web model described in Section 4.4.1. Wildlife receptors evaluated in the food web model included one herbivore (meadow vole), two insectivores (marsh wren and short-tailed shrew), and one omnivore (raccoon).

COPCs were retained for further food web evaluations if NOAEL-based HQs were above 1 and the COPC was not consistent with background for all three media. Chromium, zinc, and Total LMW PAHs were consistent with background based on a combination of comparisons to BTVs, hypothesis testing, and geochemical evaluations across the three media. All HQs for arsenic, cadmium, silver, and Total LMW PAHs were less than one. The table below summarizes the HQs above 1 for the wildlife receptors and the retained food web COPCs.

Off-Project Red Maple Swamp/Tidal Stream Food Web COPCs with HQs > 1				
Food Web COPC	**Marsh Wren**	**Meadow Vole**	**Raccoon**	**Short-tailed Shrew**
Copper	**7.8**	HQ < 1	HQ < 1	**2.7**
Lead	**7.7**	HQ < 1	HQ < 1	**1.3**
Mercury	**13.9**	1.4	0.25	**1.3**
Nickel	0.66	HQ < 1	HQ < 1	**1.3**
Selenium	**5.7**	**6.3**	**1.1**	**5.6**
Total PCB Aroclors	**3.7**	HQ < 1	HQ < 1	**1.8**
Notes: Shading identifies HQs > 1 for food web COPCs retained after background comparisons.				

4.4.3 Off-Project Narragansett Bay and Beachfront Area

4.4.3.1 Surface Sediment

Table 4-8 identifies the sediment COPCs selected based on ESV comparisons for the surface sediment collected from the off-Project Narragansett Bay and Beachfront area. The table below identifies the preliminary surface sediment COPCs identified based on a maximum detected concentration above the sediment ESV for COPC selections (as shown in **Table 4-2**), or the chemicals lacked ESVs. Shading in the table identifies the COPCs retained after the background comparisons and maximum HQs are provided for these COPCs.

Off-Project Narragansett Bay and Beachfront Surface Sediment COPC Selection		
Preliminary COPC	**Eliminated as a COPC Based On -**	**Maximum HQ for Retained COPC**
Aluminum	Hypothesis testing	NCOPC
Thallium	BTV	NCOPC
Total PCB Aroclors	**--**	**2.1**
Carbon Disulfide	**--**	**13.4**

Notes:
Shading identifies COPCs retained after background comparisons.
Maximum HQ = Maximum detected concentration / COPC selection ESV.
NCOPC – Not a COPC.

The maximum detected concentrations of total PCBs and carbon disulfide are greater than the benthic invertebrate ESVs with HQs of 2.1 and 13.4, respectively. PCBs were detected in each of the ten sediment samples with similar concentrations (ranging from 0.070 to 0.083 mg/kg). Carbon disulfide was detected in just over half of the sediment samples and all but one detected concentration exceeded the freshwater sediment ESV (a marine ESV was not identified).

4.4.3.2 Surface Water and Porewater

Table 4-11 identifies the porewater COPCs for the off-Project Narragansett Bay and Beachfront area. Surface water samples were collected from this exposure area in 2015 and analyzed for metals and VOCs; and none of these analytes were detected. The porewater COPCs were selected by comparing the maximum porewater concentrations with surface water ESVs (as shown in **Table 4-3**). Background comparisons were not used to evaluate porewater COPCs because porewater was not included in the background study. The table below identifies the porewater COPCs and provides the maximum HQs for these COPCs.

Off-Project Narragansett Bay and Beachfront Porewater COPC Selection		
Medium	**COPC**	**Maximum HQ for Retained COPC**
Porewater	**Barium – dissolved**	**7.3**
	Barium – total	**8.5**
	Lead – total	**3.7**

Notes:
Shading identifies COPCs retained after ESV comparisons.
Maximum HQ = Maximum detected concentration / COPC selection ESV.

Barium and lead were identified as COPCs in porewater but were detected relatively infrequently (FODs ranged from 5% to 10%). Barium resulted in the highest HQs when compared to the freshwater ESV (a marine ESV was not identified).

4.4.4 Uncertainty Analysis

Ecological risk assessment results depend primarily on the weight of evidence supporting particular conclusions, and each line of evidence is subject to varying degrees of uncertainty. Due to the complexity of ecosystems and the associated mechanisms that cause ecological stress, uncertainty in environmental risk characterization is inevitable. Uncertainty stems from a number of sources, including but not limited to the following:

- Sampling and statistical variability, and the use of point estimates for variables rather than distributions;
- Limitations of toxicity testing;
- Difficulty of extrapolating from laboratory data to field data;
- Uncertainties in evaluating environmental responses to mixtures of chemicals;
- Assumptions underlying the use of fate and transport models; and
- A range of conditions for which models or HQs are applicable.

Additional sources of uncertainty associated with this ecological risk characterization are described below. In general, the assumptions made in multiple points in the SLERA tend to err on the side of overestimating risks. The cumulative impact of multiple conservative assumptions is more likely to overestimate than underestimate potential risks to ecological receptors.

In general, the sampling design targeted areas with the potential to have been impacted by historical Project-related activities. However, portions of these areas may not represent preferred ecological habitats or areas likely to be frequented by ecological receptors. This is particularly true in the vicinity of the buildings and parking lots in the on-Project area and the walking path of the off-Project Red Maple Swamp/tidal stream area, which may be unattractive to some wildlife receptors. Therefore, ecological exposures to some samples may be limited or receptors may prefer to forage in other areas. This type of sampling is expected to bias results high.

ISM sampling for PCBs is expected to provide a more accurate estimate of potential PCB exposures across the on-Project Blue Beach area than the discrete sampling conducted for other chemicals. As indicated above, the discrete sampling was often biased towards areas expected to have been impacted by historical Project-related activities, which tends to overestimate actual exposures of ecological receptors to COPCs over an area.

4.4.4.1 Uncertainties in the Ecological Toxicity Assessment

The risk screening is based on the assumption that the detected chemicals are 100% bioavailable and that the most sensitive life stages of each environmental receptor are present. The screening values are conservative and often based on toxicity tests performed with sensitive test organisms. These factors are likely to overestimate the actual risk to receptors at the Project.

Similarly, bioavailability in prey items is likely overestimated because the food web models assumed that the COPCs consumed by wildlife receptors were present in a form that was 100% bioavailable (100% of the COPC is assimilated by the organism after ingestion). However, this is unlikely.

It is recognized that laboratory data that are used for generating screening or protective criteria may not have been obtained under conditions that accurately represent the complexities of potential exposures in the field. Laboratory-based ecological screening values are typically derived under conditions that favor high bioavailability (e.g., using sediment with low pH and organic matter [USEPA, 2005c] or using soluble chemical forms [lead acetate] to conduct tests). Therefore, the weathered chemical present at the Site, is likely to be in a less soluble form than that used in the laboratory study. In such circumstances, risk is overestimated.

Conservative assumptions are incorporated into the derivation of the ESVs. For example, the Eco-SSLs for wildlife assume that the diet of the receptor is obtained solely from impacted soil and food items. However, these receptors are also likely to feed in un-impacted areas such that overall dietary exposure would be much lower (i.e., diet incorporates exposure to areas within and outside of the Project with lower soil concentrations of COPCs) so the

wildlife Eco-SSLs may be overly conservative. Similarly, the diet assumptions used to derive some of the Eco-SSLs, for insectivores in particular, may be overly conservative because it is assumed that the avian and mammalian insectivores have an exclusive diet of earthworms when in reality insectivore diets can include insects and mammals. Furthermore, Eco-SSLs are derived to be protective of the conservative end of the exposure and effects species distribution for the four groups of ecological receptors (i.e., plants, soil invertebrates, birds, and mammals).

Toxicological studies on which screening values are based deal with a single chemical. Effects resulting from a simultaneous exposure to multiple chemicals are usually not addressed in those studies. The community-level screening values and wildlife TRVs used do not generally account for possible synergistic, antagonistic, or additive effects of COPC mixtures in environmental media. These factors may result in an underestimate or overestimate of potential risk. Assessing potential risks due to exposures to chemical mixtures is challenging as chemicals within the mixture may not be equally bioavailable and may not act on the receptor with the same toxic mechanisms.

Community-level ESVs are not available for all of the chemicals that were analyzed in surface soil, surface water, and sediment. Therefore, the potential risks from these chemicals were not estimated for inclusion in the risk assessment and the total risk may be underestimated. These chemicals were carried forward as COPCs; however, the lack of ESVs contributes to the uncertainty associated with this risk assessment.

For the purposes of screening hydric soil data, terrestrial soil ESVs were used to compare with the maximum detected hydric soil concentrations. However, the soil ESVs were developed based on the exposures of soil invertebrates and plants and it is uncertain if they are applicable to hydric soil conditions, e.g., seasonal or tidal flooding. Therefore, it is unknown if the use of the soil ESVs over- or underestimates risks for the hydric soil pathway.

For some inorganic chemicals in surface water, ESVs are calculated based on the hardness of the water. Hardness data was available for the off-Project Red Maple Swamp/tidal stream area surface water data but not for the porewater data. The average hardness value for surface water (183 mg/kg) was used to adjust the porewater ESVs. It is unknown if this is an over or under estimation of hardness in pore water.

4.4.4.2 Uncertainties in Exposure Modeling

Exposure modeling includes multiple assumptions that add uncertainty to each step of the process. The first step in estimating uptake or intake of COPCs by representative species is determining the EPC of COPCs. The EPC is used to estimate the chemical exposure of an individual using the Site as a foraging area. This step depends on several assumptions that create uncertainty. In accordance with USEPA guidance (1997), the maximum concentrations of COPCs measured in each media and exposure area (with the exception of PCBs in soil from the on-Project Blue Beach area as discussed in Section 4.31.) were selected to represent the maximum exposure for screening purposes. This is more conservative than using the average or 95% UCL COPC concentrations and will tend to overestimate exposure and thus overestimate risk.

Other sources of uncertainty associated with the EPC include chemical bioavailability and mobility. Extraction methods used to determine chemical concentrations in soil and sediment are rigorous and destructive; chemicals are often sorbed to soil or sediment particles such that they may not be available to ecological receptors under environmental conditions.

The use of BAFs in exposure modeling, rather than Site-specific tissue data, also represents a source of uncertainty. The physical characteristics of the soil or sediment in the study that were used to derive the BAFs, may not match the Site soil characteristics. The potential for variation between species of plants, earthworms, and benthic invertebrates is not accounted for, and the similarity of test species to species on-Site is not accounted for by the use of a BAF. Furthermore, the use of surrogate chemicals or default values was required when BAFs were unavailable for a some COPCs. BAFs are available only for a subset of chemicals, so a default BAF of 1 was used as a surrogate when appropriate chemical surrogates were not available (e.g., invertebrate concentration equal to soil concentration). However, BAFs are available for most chemicals known to bioaccumulate.

Species-specific exposure factors are another source of uncertainty. The exposure models used to predict uptake of COPCs by animals via various pathways depend on factors such as body weight, daily food and water intake, and the percentage of soil, plant, and prey material constituting the food intake. These values are all point estimates and each are associated with uncertainty.

The SLERA evaluates the most likely pathways for the COPCs associated with the Project. In addition to the pathways that were evaluated, other lower exposure pathways were not included in this evaluation and this adds an additional uncertainty that has the potential to underestimate risks. Exposure pathways that were not considered include plant absorption of air chemicals, inhalation of contaminated dust by animals, and dermal absorption of chemicals from soil by animals other than soil invertebrates. These routes could contribute to the overall exposure of representative species to chemicals in soil and sediment. These pathways are expected to have a minimum contribution toward exposure compared to the pathways chosen for quantitative evaluation. This small possibility of underestimating risks is not of a magnitude that it would offset the otherwise conservative assumptions made in the exposure modeling.

4.4.4.3 Uncertainty in the Hazard Quotient Method

The use of HQs for the assessment of risk presents some level of uncertainty. Primarily, calculation of an HQ is based on exposure modeling and development of criteria or screening values, two exercises that have uncertainty in and of themselves. Although the endpoints measured in most toxicological studies used to generate the screening values are the same (development/growth/ reproduction/survival), the effects of simultaneous exposure to multiple constituents may be, for example, synergistic or antagonistic (i.e., not necessarily additive). Thus, HQs for specific chemical, receptor, and pathway combinations were not calculated at this screening level. This contributes to uncertainty in the calculated HQs for the pathway and, consequently, the HQ for the receptor from all pathways.

4.4.4.4 Uncertainties Associated with Background and Geochemical Evaluations

Because of the natural variation of metals present in soils and sediment from different geological areas, local populations of plants and animals have adapted over time to local soil conditions. Although the risk assessment may identify a metal in soil as a potential risk to local receptors, if the maximum detected concentration of the metal is within the normal background range for the local soil, it is assumed that the metal does not present an unacceptable risk to local ecological receptors. “Normal” varies from place to place, depending on the kinds of rocks or other parent materials that occur in the area from which the soil is derived.

A background evaluation and a geochemical evaluation were included in this SLERA to estimate normal concentrations and focus the risk evaluation on COPCs that may be related to historical DoD activities associated with the on-Project area. The purpose of these evaluations was to avoid overestimating Site-related risks by eliminating chemicals that are present based on natural conditions or non-DoD anthropogenic sources (e.g., PAHs from atmospheric deposition or road runoff). This approach focuses the risk calculations on Site-related risks that a receptor may be exposed to on-Site.

The background datasets considered in **Attachment D** represent concentrations of metals, PAHs, and other SVOCs from un-impacted areas. Metals may be naturally occurring and derived from local geological formations. PAHs may also be naturally occurring (e.g., from forest fires), but PAHs and other organic constituents may also present in the environment due to anthropogenic sources related to incomplete combustion of organic materials (e.g., oil, coal, wood) or spills. The available background samples may not represent the full spread of conditions observed within the on-Project and off-Project exposure areas (e.g., pH, TOC, and hardness), so some uncertainties are associated with the background evaluation. Therefore, the geochemical evaluation was included to further evaluate metals relative to naturally occurring conditions. The interpretation of these evaluations, particularly the geochemical correlations, is somewhat subjective but is typically based on multiple lines of evidence to avoid excluding a chemical that is truly Site-related.

4.5 SLERA Conclusions

The USEPA guidance for the SLERA (USEPA 1997) allows for the following possible decisions:

- There is adequate information to conclude that ecological risks are negligible and, therefore, remediation is not needed based on ecological risk.
- The information is not adequate to make a decision at this point, and the ecological risk assessment will continue to Step 3.
- Information indicates a potential for adverse ecological effects, and a more thorough assessment is warranted.

A number of chemicals in surface soil, surface hydric soil, sediment, surface water, and porewater have HQs greater than or equal to 1, indicating a potential for adverse effects to representative species from exposure to these media. Based on this evaluation, the SMDP is to continue the ERA into Step 3.

Table 4-14 summarizes the COPCs retained in each exposure area and media based on the ESV comparisons or the food web models. These COPCs are retained for further evaluation in Step 3a, the first step of the BERA.

4.6 Step 3a COPC Refinement

The results of the SLERA were summarized in Section 4.5 and included Steps 1 and 2 of the eight-step USEPA ERA approach (USEPA 1997). The BERA follows a subsequent multi-step process (Steps 3 through 8) to evaluate ecological risks and to determine whether Site remediation is warranted from an ecological perspective. The BERA process includes decision criteria for exiting from, or proceeding with, the ERA process at multiple points, including in Step 3.

The purpose of Step 3a is to reevaluate COPCs that were retained in the SLERA for further evaluation, and to identify and eliminate from further consideration those COPCs that were retained because of the use of conservative exposure scenarios.

In Step 3a, the SLERA risk estimates were recalculated using less conservative but more realistic assumptions. Step 3a uses the same representative species and exposure pathways, but with refined, central tendency exposure assumptions to more realistically estimate the potential risk to ecological receptors from COPCs that were carried through the conservative SLERA screening process.

The list of COPCs identified in the SLERA was refined using these calculated risk estimates to remove COPCs from further consideration. The Step 3a questions that help refine the SLERA included the following:

- Do any of the COPCs identified in the SLERA occur infrequently at any of the sites (i.e., in less than 5% of the samples)? If so, the exposure of representative species may be overestimated.
- Are high concentrations and risks widespread across the site or limited to discrete locations? (magnitude and extent of contamination and risk)
- Could the COPC be in a chemical form that is less hazardous? (bioavailability of the COPC)
- Do more realistic exposure assumptions reduce potential risk to an acceptable level?

The evaluation presented in this section presents a refinement of the COPCs based on the following factors:

- Evaluation of COPCs with low FOD (≤5%) and sufficient data from acceptable site characterization (at least 20 samples).
- Evaluation of more representative EPCs;
- Evaluation of alternative ESVs for the community-level ecological receptor evaluations (e.g., soil invertebrate community, plant community, benthic invertebrate community, surface water community);
- Evaluation of more representative exposure assumptions for wildlife receptors evaluated in the food web models; and
- Evaluation of alternative TRVs for wildlife receptors evaluated in the food web models.

After the reevaluation/refinement, the decision criteria for Step 3a included:

- If the reevaluation of the conservative exposure assumptions used in the SLERA supports an acceptable risk determination for all COPCs, then a no further action designation was warranted, and the site exits the ERA process.
- If the reevaluation of the conservative exposure assumptions does not support an acceptable risk, the BERA process continues to Step 3b or remediation.

Similar to the SLERA process, Step 3a utilizes existing data with additional information obtained primarily from a literature search. Additionally, Step 3a employs the same dose models and risk characterization methods as those used in the SLERA, with changes to the values of some input parameters.

To further refine estimates of risk for the benthic invertebrate community in the tidal stream of the off-Project Red Maple Swamp/tidal stream, additional field efforts included collection of data to assess the bioavailability of divalent metals (i.e., simultaneously extracted metals [SEM], acid volatile sulfides [AVS], and total organic carbon [TOC] data), sediment toxicity testing, and macroinvertebrate community sampling.

4.6.1 Step 3a Refinement Approach

Those chemicals that were detected in surface soil, surface hydric soil, sediment, surface water, and porewater and that had HQ values of 1 or greater for terrestrial ecological receptors, benthic organisms, aquatic life, or wildlife, and were not consistent with or below background conditions or not eliminated based on the geochemical evaluation, were retained for further evaluation in Step 3a of the BERA (see **Table 4-14**).

The EPCs considered in the SLERA were the maximum detected concentration in the relevant media datasets; this approach is conservative, particularly for mobile receptors. In Step 3a, the average exposure is estimated as the 95% UCL of the mean, which conservatively represents the RME expected for ecological resources. For the discrete datasets, the selected EPC for Step 3a is the lesser of the 95% UCL or the maximum concentration. UCLs were calculated using USEPA's ProUCL Version 5.1 software (USEPA 2016). Supporting documentation for the UCLs is provided in **Attachment B**.

The EPCs for Total PCBs in surface soil within the on-Project Blue Beach area (the ISM soil dataset) are equal to the weighted mean UCL concentration of the SU-specific 95% UCLs based on SU size (acreage), calculated as described in Section 2.2.4.2. and provided in **Attachment C**.

Alternative ESVs used to refine the COPCs were obtained from several sources, including compilations of screening values used by other USEPA regions and the LANL database (LANL, 2017). These alternative ESVs represent concentrations above which adverse effects to ecological receptors are more likely to occur (e.g., probable effect levels for sediment, LANL low effect screening levels for plants and soil invertebrates).

Multiple conservative assumptions were considered in determining the potential exposure of wildlife receptors to the COPCs in the screening level food web model. These included use of the maximum detected concentrations, NOAEL-based TRVs, and conservative assumptions about wildlife exposure parameters (e.g., exposure duration [ED], area use factor [AUF]). Therefore, the refinement of the wildlife COPCs considered more realistic values for these food web inputs.

Typically, the ED considers potential seasonal limitations for exposure such as migration of organisms out of the region. For this Step 3a refinement step, it was assumed that the food web receptors could forage all year round and no reduction in exposure due to seasonal migration was used.

For the AUFs, the potential size of the available habitat relative to the expected normal spatial range of species foraging and nesting activities was considered. For some receptors (e.g., raccoon), the size of the exposure areas is small with regard to the potential home ranges (USEPA, 1993c). Therefore, the amount of time spent within the exposure areas may be only a small proportion of the animal's expected range. AUFs were estimated using home ranges identified for each receptor from USEPA guidance and estimates of the acreage of the on-Project and off-Project exposure areas. When the home range was smaller than the exposure area the AUF remained at 1. For more far ranging receptors, the AUF was less than 1 so that the exposure estimate only reflected the amount of the diet likely to be obtained from within the exposure area.

The TRVs considered in the screening level food web models were based on NOAELs. However, evaluation against a NOAEL-based TRV only identifies levels below which no effect has been seen. It is also useful to consider the chemical concentration at which adverse effects start to manifest (i.e., LOAEL-based TRV). These two approaches are considered to constitute the lower bound (i.e., conservative screening level assumptions and NOAEL-based TRVs) and upper bound (i.e., more realistic assumptions, LOAEL-based TRVs) of the TRV range (USEPA, 1997). The difference in the risk estimates based on the different toxicity-based TRV endpoints may be evaluated to allow

further interpretation of the risk results. Therefore, the refined food web models considered TRVs based on both NOAELs and LOAELs.

4.6.2 Step 3a Risk Calculations

The Step 3a risk calculations for direct contact exposures included comparisons of the maximum EPCs (i.e., the lower of the maximum detected concentration or the 95% UCL) against both the screening level ESVs (identified in **Tables 4-1 through 4-3**) and the alternative effect-based screening levels. This approach is similar to the refined food web models which include both NOAEL- and LOAEL-based TRVs. The Step 3a risk calculations are summarized in the following sub-sections by media and exposure type.

Soil EPCs were calculated differently for discrete and ISM datasets. The EPCs for Total PCB Aroclors in surface and subsurface soil within the on-Project Blue Beach area (ISM soil datasets) are equal to the weighted mean UCL concentration of the SU-specific 95% UCLs based on SU size (acreage), calculated as described in Section 2.2.4.2. Soil EPCs for all other COPCs associated with discrete sample datasets are equal to the 95% UCL concentration, calculated as described in Section 2.2.4.1, or the maximum detected concentration if an appropriate 95% UCL was not calculated by ProUCL due to one of the scenarios previously described.

4.6.2.1 Surface Soil Direct Contact

Potential impacts to the terrestrial plant and invertebrate communities were evaluated in Step 3a by comparing maximum surface soil EPCs against plant- and invertebrate-based ESVs (**Table 4-15**).

In the on-Project Blue Beach area, the maximum EPC for bis(2-ethylhexyl)phthalate exceeded the screening level ESV for plants, but was well below the refined ESV for plants. No other EPCs exceeded the plant ESVs. For soil invertebrates, the maximum EPCs for zinc, total PCBs, benzoic acid, bis(2-ethylhexyl)phthalate, and acetone exceeded the screening level ESVs for invertebrates, but, with the exception of benzoic acid, were well below the refined ESVs for invertebrates. The soil invertebrate HQ was 2.5 for benzoic acid; however, this was based on a single detected concentration out of 26 samples. All of the nondetect values (detection limits) are below the refined ESV for soil invertebrates. This COPC is eliminated based on a low FOD (<5% detected and greater than 20 samples).

In the off-Project Red Maple Swamp/tidal stream area, Total PCBs were the only COPC retained for surface soil associated with the walking path. The maximum surface soil EPC was below the screening level ESV for plants, and above the screening level ESV for soil invertebrates (based on a Dutch Target Value reported by Buchman [2008]). An alternative soil invertebrate ESV was not identified for PCBs so a benthic invertebrate ESV was used to further evaluate potential invertebrate risks. The maximum surface soil EPC for Total PCBs was below the refined ESV for invertebrates.

These results indicate that risks to terrestrial plants and soil invertebrates are not expected due to direct exposure to COPCs in surface soil and no further evaluation of this pathway is warranted.

4.6.2.2 Surface Hydric Soil Direct Contact

Potential impacts to the wetland plant and invertebrate communities were evaluated in Step 3a by comparing maximum surface hydric soil EPCs against plant- and invertebrate-based ESVs (**Table 4-16**).

In the off-Project Red Maple Swamp/tidal stream area, the maximum EPCs for lead, selenium, and 2,4-dichlorophenol exceeded the screening level ESVs for plants but were below the refined ESVs. The maximum EPCs for mercury, Total PCBs, 2,4-dichlorophenol, acetone, carbon disulfide, and toluene exceeded the screening level ESVs for invertebrates, and, with the exception of total PCBs, were below the refined ESVs for invertebrates. Due to the lack of a soil invertebrate-based ESV for Total PCBs, a benthic invertebrate ESV was used to evaluate potential invertebrate risks. The maximum hydric soil EPC exceeded the benthic invertebrate ESV used in the refined screen.

These results indicate that, with the exception of Total PCBs, risks to wetland plants and invertebrates are not expected due to direct exposure to COPCs in surface hydric soil. Only Total PCBs in surface hydric soil warrant further evaluation (see Section 4.6.3).

4.6.2.3 Sediment Direct Contact

Potential impacts to the benthic invertebrate communities were evaluated in Step 3a by comparing maximum surface sediment EPCs against benthic invertebrate community-based ESVs (**Table 4-17**).

In the off-Project Red Maple Swamp/tidal stream area, the maximum EPCs for Total PCBs, bis(2-ethylhexyl)phthalate, and carbon disulfide exceeded the screening level ESVs but, with the exception of Total PCBs, were below the refined ESVs. Screening level ESVs were not available for 2-butanone and acetone, but the maximum EPCs for these COPCS were below the refined ESVs.

In the off-Project Narragansett Bay and Beachfront Area, the maximum EPCs for Total PCBs and carbon disulfide exceeded the screening level ESVs but were below the refined ESVs.

These results indicate that, with the exception of Total PCBs in sediment associated with the tidal stream, risks to benthic invertebrates are not expected due to direct exposure to COPCs in sediment.

Additional field efforts were conducted to further assess the potential for risks to benthic invertebrates within the tidal stream. This additional sampling focused on ten sampling locations within the tidal stream: five located between Circuit Drive and outfall 025 (background/reference sediment samples) and five located between outfall 025 and Narragansett Bay (referred to as Site samples for the purpose of the additional assessment in the tidal stream).

SEM, AVS, and TOC were measured in ten samples collected in May 2020 to evaluate potential divalent metals bioavailability. USEPA (2005) guidance on metals bioavailability evaluates possible binding of metals by both AVS and organic matter. Therefore, data were evaluated on a sample-by-sample basis using the following scale to evaluate whether the organic carbon binding phase (represented as fraction organic carbon or foc), in conjunction with the AVS, is affecting the bioavailability of divalent metals in sediments:

- If the $(\sum SEM\text{-}AVS)/f_{oc}$ excess exceeds 3,000 µmol/gram of organic carbon (g_{oc}), the sediments are presumed to be "likely to be toxic";
- If the (∑SEM-AVS)/foc excess is between 130 and 3,000 $\mu mol/g_{oc}$, predictions of effects are uncertain; and
- If the $(\sum SEM\text{-}AVS)/f_{oc}$ excess is less than 130 $\mu mol/g_{oc}$, the sediments are presumed to "not likely" be toxic.

As indicated in **Table 4-18**, all ten of the samples were found “not likely to be toxic.” These results indicate that divalent metals are not expected to be bioavailable and, therefore, are not toxic to benthic invertebrates present in the tidal stream.

Table 4-19 summarizes the results of 28-day sediment toxicity tests conducted with an amphipod (*Leptocheirus plumulosus*). Toxicity tests were conducted under specified laboratory conditions using bulk sediment samples collected in May 2020 and the associated laboratory toxicity report is provided in **Attachment H**. Standardized statistical tests were conducted to identify significant differences in survival, growth, biomass, or reproduction between individual off-Project tidal stream samples and the upstream background/reference locations, and between individual stream and laboratory control samples. The individual paired statistics were performed by the laboratory using Comprehensive Environmental Toxicity Information System (CETIS), version 1.9.6.3 software and program exports are included in **Attachment H**.

Data sets were evaluated to determine normality of distribution and homogeneity of sample variance. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistic. If outliers were found in the data set, then the analysis was conducted both with and without the outlier included in the data set. Pair-wise comparisons were made using the appropriate statistical evaluation. Statistical difference was evaluated at $\alpha = 0.05$. A statistical difference between an individual off-Project tidal stream sample and an individual background/reference sample is not necessarily indicative of an off-Project tidal stream sample that is different from background conditions as a whole.

As indicated in **Table 4-19**, samples collected from SED-333 and SED-337 were not statistically different from the laboratory control or the upstream background/reference samples. The sample collected from SED-335 showed statistical differences from the laboratory control and/or a sub-set of the upstream background/reference samples for all tested endpoints. The samples collected from SED-331 and SED-339 showed statistical differences from the laboratory control and/or a sub-set of the upstream background/reference samples for growth and reproduction endpoints but not for survival.

Macroinvertebrate samples were collected from these ten stream locations in May 2020 and samples were processed in the laboratory and invertebrates were identified to the lowest practical level (generally genus or species) and

enumerated by taxon. **Attachment I** provides the individual invertebrate counts and associated metrics from each sample. The community metrics are summarized in **Table 4-20** and include total richness (number of taxa), total density (number of specimens), Shannon Diversity Index (a measure of biological diversity), and the Hilsenhoff Biotic Index (HBI; a measure of pollution tolerance). In general, the metrics were variable both upstream from and downstream from outfall 025 with no clear spatial pattern.

Additional characterization of the potential for risks to the benthic invertebrate community off-Project tidal stream are provided in Section 4.6.3.

4.6.2.4 Surface Water Direct Contact

Potential impacts to aquatic life were evaluated in Step 3a by comparing maximum surface water EPCs against aquatic life-based ESVs (**Table 4-21**).

In the off-Project Red Maple Swamp/tidal stream area, the maximum surface water EPCs for barium (dissolved and total) and carbon disulfide exceeded the screening level aquatic life ESVs (based on chronic exposures) but were below the refined ESVs (based on acute exposures). It is recognized that the use of an acute screening value for evaluating surface water may underestimate chronic exposures, so the basis of the screening levels ESVs was also re-considered.

The surface water screening level ESV for barium is a USEPA Region 3 freshwater screening benchmark for dissolved barium (4 ug/L). This ESV is a Tier II secondary chronic value (SCV) presented by Suter and Tsao (1996) and is based on 16% reproductive impairment at 5,800 ug/L in a 21-day test on *Daphnia magna* (detected concentrations of barium in aqueous samples were below this level). Tier II values are based on a smaller data set than is required to develop a state water quality standard or AWQC and uncertainty factors are applied to the available data to derive the SCV.

Recent Dutch guidance (RIVM, 2020) suggested a chronic freshwater screening level for barium of 624 ug/L based on data for algae, invertebrates and fish. The Dutch guidance could not derive a marine screening level based on a lack of studies. Only a single reliable marine study was identified which reported a chronic no observed effect concentration (NOEC) of 100 ug/L dissolved barium for embryonic development of Californian mussels. Detected concentrations of barium were below this level. Therefore, the risks predicted based on the screening level (chronic) ESV for barium appear to be overestimated.

The screening level ESV for carbon disulfide in surface water (0.92 ug/L) is also a USEPA Region 3 freshwater screening benchmarks based on a Tier II SCV presented by Suter and Tsao (1996). The lowest chronic values (LCV) for daphnids and fish were estimated at reported as 244 ug/L and over 9,500 ug/L (Suter and Tsao, 1996). As stated above for barium, the SCV is derived by applying uncertainty factors to the available data. The surface water ESV is 265 times lower than the lowest LCV reported for daphnids. The single detection of carbon disulfide in surface water from off-Project Red Maple Swamp/tidal stream area is well below the LCV for daphnids. Therefore, the risks predicted based on the screening level (chronic) ESV for carbon disulfide appear to be overestimated.

These results indicate that chronic (and acute) risks to aquatic life are not expected due to direct exposure to COPCs in surface water and no further evaluation of this pathway is warranted.

4.6.2.5 Porewater Direct Contact

Benthic invertebrates present within the sediment may be exposed to porewater concentrations of COPCs. Therefore, in addition to considering sediment exposures, potential impacts to benthic invertebrates was evaluated in Step 3a by comparing maximum porewater EPCs against aquatic life-based ESVs (**Table 4-22**).

In the off-Project Red Maple Swamp/tidal stream area, the maximum porewater EPCs for barium (dissolved and total), lead (dissolved), silver (total) and toluene exceeded the screening level aquatic life ESVs (based on chronic exposures) but were below the refined ESVs (based on acute exposures). Toluene was also eliminated based on a low FOD (<5% detects and at least 20 samples).

In the off-Project Narragansett Bay and Beachfront Area, the maximum porewater EPCs for barium (dissolved and total), and lead (total), exceeded the screening level aquatic life ESVs (based on chronic exposures) and were below the refined ESVs (based on acute exposures).

It is recognized that the use of an acute screening value for evaluating porewater may underestimate chronic exposures, so the basis of the screening levels ESVs and the range and frequency of porewater detections were considered.

As described above, the barium ESV (4 ug/L) is based on a Tier II SCV. All of the porewater concentrations of barium in both exposure areas are below the proposed Dutch freshwater chronic value of 624 ug/L and the chronic marine NOEC of 100 ug/L (RIVM, 2020). Therefore, porewater risks predicted based on the screening level (chronic) ESV for barium appear to be overestimated.

The screening level lead ESVs were based on the freshwater and marine AWQCs (4.8 and 5.6 ug/L, respectively). Lead was detected infrequently in both exposure areas. In the off-Project Red Maple Swamp/tidal stream area the only detected concentration of dissolved lead (19.6 ug/L) was collected from location PW-3-2014 (collected at a depth of 2.7-3 ft in 2014); however, lead was not detected in porewater at this location (PW-103, collected at a shallower depth of 0.75 to 1 ft) in 2011. There are also some uncertainties associated with the dissolved lead detection since total lead was not detected at a detection limit of 2 ug/L at the same location and sampling event. In the off-Project Narragansett Bay and Beachfront Area, lead was analyzed in total and dissolved phase in 10 samples. Total recoverable lead was detected at two locations in 2015 (PW-OFF-7 and PW-OFF-9) and both concentrations (17.8 and 20.8 ug/L, respectively) are higher than the marine screening level ESV of 5.6 ug/L. Locations PW-OFF-7 and PW-OFF-9 coincide with the end of the recreation trail on the beach.

The screening level silver ESV (0.23 ug/L) for off-Project Red Maple Swamp/tidal stream area was based on the USEPA Region 3 marine surface water screening value. Silver was detected in only one out of 10 samples at location PW-104 in 2011 and this concentration (0.51 ug/L) exceeds the screening level ESV.

All of the porewater samples were collected from depths of 0.75 to 3 ft below the sediment surface which is likely representative of groundwater flow and may overestimate porewater exposures for benthic receptors exposed to more shallow sediment horizons. It is likely that these porewater samples overestimate actual exposures to COPCs in more shallow horizons that incorporate dilution with surface water.

Lead and silver were detected infrequently in the dissolved and total recoverable samples collected from each of the exposure areas. In addition, lead and silver were not retained as COPCs in sediment or surface water in these exposure areas. Therefore, it is expected that chronic risks due to porewater exposure are overestimated based on the evaluation of the detected porewater concentrations.

These results indicate that chronic (and acute) risks to benthic invertebrates are not expected due to direct exposure to COPCs in porewater and no further evaluation of this pathway is warranted.

4.6.2.6 On-Project Food Web Exposures

Based on the results of the screening level food web model, the refined food web model for the on-Project Blue Beach area evaluated the potential for risks to the American robin, raccoon, and short-tailed shrew using the maximum surface soil EPC. **Table 4-23** summarizes the HQs based on the NOAEL- and LOAEL-based TRVs and calculations are provided in **Attachment G-3**.

All HQs for the raccoon and all LOAEL-based HQs for the American robin and short-tailed shrew were less than 1. The NOAEL-based HQs above 1 are summarized below:

- American robin – cadmium (HQ = 1.6), lead (HQ = 3.8), and Total PCBs (HQ = 1.7)
- Short-tailed shrew – cadmium (HQ = 2.6) and Total PCBs (HQ = 1.5)

The refined food web model assumed that the robin and shrew obtained all of their diet from soil invertebrates on-Project Blue Beach area and the invertebrate ingestion component (rather than incidental soil ingestion) dominates the calculated doses for these receptors. The raccoon has a much larger home range and was assumed to forage outside of the exposure area. However, all of the HQs for the raccoon would still be below 1 if it was assumed that the raccoon only foraged within the exposure area (AUF of 1).

4.6.2.7 Off-Project Food Web Exposures

Based on the results of the screening level food web model, the refined food web model for the off-Project Red Maple swamp/tidal stream area evaluated the potential for risks to the marsh wren, meadow vole, raccoon, and short-tailed

shrew using the maximum EPC based on the surface soil, hydric soil, and sediment datasets from this exposure area. **Table 4-24** summarizes the HQs based on the NOAEL- and LOAEL-based TRVs and calculations are provided in **Attachment G-4**.

All HQs for the raccoon and all LOAEL-based HQs for the marsh wren, meadow vole, raccoon, and short-tailed shrew were less than 1. The NOAEL-based HQs above 1 are summarized below:

- Marsh wren – copper (HQ = 2.5), lead (HQ = 1.2), mercury (4.5), selenium (1.4), and Total PCBs (HQ = 1.3)
- Meadow vole – selenium (HQ = 1.3)
- Short-tailed shrew – selenium (HQ = 1.3) and Total PCBs (HQ = 1.6)

The refined food web model assumed that the marsh wren, meadow vole, and shrew obtained all of their diet from food items present within the off-Project Red Maple swamp/tidal stream area. It was assumed that the wren and shrew would consume only wetland invertebrates and the vole would feed only on wetland plants. The raccoon has a much larger home range and was assumed to forage outside of the exposure area. However, all of the HQs for the raccoon would still be below 1 if it was assumed that the raccoon only foraged within the exposure area (AUF of 1).

4.6.3 Step 3a Uncertainty Analysis

Many of the uncertainties described in Section 4.4.4 also apply to the refined evaluation. Although some conservative assumptions from the SLERA were reduced in the refinement step (e.g., use of alternate EPCs, LOAEL-based TRVs), the general ERA approach is still more likely to over-estimate rather than under-estimate ecological risks.

AUFs less than 1 were used for the raccoon in the Step 3a food web models to refine the conservative risks in the SLERA which assumed a receptor only feeds within an exposure area. The remaining receptors considered in the Step 3a food web models (e.g., robin, marsh wren, meadow vole, shrew) have smaller home ranges and AUFs remained at 1. In these cases, it is assumed that if an animal has a home range that is smaller than the exposure area, there will be one or more individuals inhabiting the exposure area and deriving 100% of its resources from the exposure area. This is a significant uncertainty, and likely to overestimate risk because actual home ranges vary considerably in space and time depending on the actual available resources (including shelter and water) provided by the exposure area. It is unlikely that an individual mobile receptor will be present wholly within the exposure area throughout its lifecycle. In addition, for receptors with home ranges similar in size to the exposure area, no more than one or a few individuals would be expected to occupy the area. This overestimates population level risk, as most members of the local population are not affected by the exposure area. This is particularly true for the on-Project Blue Beach area which encompasses approximately 3.2 acres of open space around active buildings.

Plants and, to a lesser degree, soil, sediment, and aquatic invertebrates are more bound to a single location as they lack mobility and can occur in large numbers and densities over small areas. For this reason, there is less overestimation of risk, although the actual adverse effects would be expected to be highly localized to actual locations with elevated concentrations.

Samples for SEM, AVS, and TOC, sediment toxicity testing, and macroinvertebrate community metrics were collected from within the off-Project tidal stream to further assess the potential for risks to benthic invertebrates. Initially, sediment chemistry samples (e.g., metals, SVOCs, PCBs, etc.) and sediment toxicity testing samples were collected in the fall of 2019. The toxicity test did not meet test acceptability criteria so new samples for toxicity testing were collected in May 2020 from the same locations sampled in 2019. The May 2020 field event also included SEM, AVS, and TOC sampling and macroinvertebrate community sampling. While the sediment chemistry, toxicity testing, and macroinvertebrate community samples are co-located in space (i.e., from the same locations), the sediment chemistry samples were collected more than six months earlier than the toxicity testing and macroinvertebrate community samples. This results in some level of uncertainty associated with the evaluation of these data to identify COPC-related impacts.

An upgradient tidal stream was not accessible for background/reference sampling for the toxicity testing and macroinvertebrate community, so the most upstream portion of the stream located between Circuit Drive and outfall 025 was treated as the upstream background/reference area for the interpretation of the toxicity testing and macroinvertebrate community results. This portion of the stream is upgradient of historical DoD sources and captures

contributions from road runoff and other sources than could discharge into the tidal stream. The conditions in the upper portion of the stream at the time of the macroinvertebrate sampling were much drier than in the downstream portions of the stream that are subject to more tidal influence. In some cases, invertebrate samples in the background/reference area were collected by passing sediment through the kicknet rather than by passing the kicknet through the water. These differences in habitat may result in some differences in the macroinvertebrate community between the areas.

4.6.4 Step 3a Risk Characterization

The Step 3a risk evaluation assessed COPCs and exposure pathways that were carried through the initial conservative screening process. In the Step 3a refinement process, risk calculations were analyzed and interpreted to determine the likelihood of adverse environmental effects, and to determine whether a conclusion of no significant risk can be reached for each assessment endpoint evaluated. The ecological risk characterization summarizes the results of the risk calculations and provides an interpretation of the ecologically significant findings.

Aspects of ecological significance that may be considered to help place sites into a broader ecological context include the nature and magnitude of effects, spatial and temporal patterns of effects, results of the background/reference site analyses, and potential for recovery once a stressor has been removed.

Risk characterization incorporates all available data for the COPCs and pathways. For each assessment endpoint, the risk characterization includes a risk estimate (i.e., the HQ), determination of ecological significance and risk acceptability, and evaluation of the uncertainties.

Two exit criteria were used in selecting a risk management decision for the Site following the completion of Step 3a. These criteria are:

- No further evaluation and no remediation from an ecological perspective are warranted because the Site does not pose unacceptable risk, or
- The Site poses potentially unacceptable ecological risks and the BERA process continues to Step 3b or remediation.

If the characterization results support a “no further evaluation and no remediation” decision, the Site exits the ERA process. The sub-sections below present the risk characterization for the three exposure areas evaluated in Step 3a.

4.6.4.1 On-Project Blue Beach Area Risk Characterization

The assessment endpoints selected for the on-Project Blue Beach Area included the sustainability of local populations of soil invertebrates, plants, birds, and mammals (Section 4.2.3).

Table 4-15 presents the comparison of surface soil EPCs from the on-Project Blue Beach area with soil screening benchmarks protective of soil invertebrates and plants. All COPCs were eliminated based on either low FOD or HQs below 1. Based on this evaluation, no COPCs were retained and no further evaluation is warranted for soil invertebrates or plants in this exposure area.

Table 4-23 summarizes the HQs based on the NOAEL- and LOAEL-based TRVs used in the refined food web model. NOAEL-based HQs were above 1 for the insectivorous American robin (cadmium, lead, Total PCBs) and short-tailed shrew (cadmium and Total PCBs). This food web model assumed that these receptors obtained all of their diet only from earthworms within this exposure area with no off-Site foraging or migration in the winter months. These assumptions are likely to overestimate risks for receptors with may consume a more varied diet and forage elsewhere given that much of the on-Project area includes open areas around buildings that may not be attractive for foraging. None of the LOAEL-based HQs were above 1.

Given the conservative nature of the food web model and the lack of LOAEL-based HQs above 1, the surface soil of the on-Project Blue Beach area does not present an unacceptable risk of adverse effects to wildlife populations. Based on this evaluation, no COPCs were retained and no further evaluation is warranted for birds and mammals in this exposure area.

4.6.4.2 Off-Project Red Maple Swamp/Tidal Stream Area Risk Characterization

The assessment endpoints selected for the off-Project Red Maple Swamp/tidal stream area included the sustainability of local populations of soil invertebrates, plants, benthic invertebrates/shellfish, fish aquatic

invertebrates, birds, and mammals (Section 4.2.3). This exposure area includes surface soil associated with the walking path, hydric soil associated with the Red Maple Swamp, and sediment, surface water, and porewater associated with the tidal stream.

Table 4-15 presented the comparison of surface soil EPCs from the off-Project Red Maple Swamp/tidal stream area against soil screening benchmarks protective of soil invertebrates and plants. The only surface soil COPC identified (Total PCBs) was eliminated based on HQs below 1. **Table 4-16** presented the comparison of surface hydric soil EPCs from the off-Project Red Maple Swamp/tidal stream area against the same soil screening benchmarks. In this comparison, all of the COPCs, except Total PCBs, were eliminated based on either low FOD or HQs below 1. The hydric soil EPC did not exceed the refined plant ESV but did exceed the refined invertebrate ESV based on sediment invertebrates (refined soil-based ESVs were not identified for invertebrates). Based on this evaluation, only Total PCBs in hydric soil warrant further evaluation for potential impacts to invertebrates. Further evaluation of Total PCBs in hydric soil is provided in Section 4.6.4.2.1.

Potential risks to benthic invertebrates were assessed by evaluated COPC concentrations in surface sediment and porewater and through the evaluation of sediment toxicity testing and macroinvertebrate community metrics. The refined surface sediment comparison provided in **Table 4-17** identified only a single COPC with an HQ above 1 when probable effects-based ESVs were considered. Based on this evaluation, Total PCBs in surface sediment warrant further evaluation for potential impacts to invertebrates. The sediment toxicity testing and macroinvertebrate community metrics summarized in **Tables 4-19 and 4-20**, respectively, show some potential for adverse impacts on the benthic community within the tidal stream; however, the source of potential impacts is not identified. Further evaluation of Total PCBs in sediment and further evaluation of the sediment toxicity testing and macroinvertebrate community metrics are provided in Sections 4.6.4.2.1 and 4.6.4.2.2.

The refined porewater evaluation presented in **Table 4-22** identified HQs above 1 when chronic ESVs were considered but not when acute ESVs were considered. As discussed in Section 4.6.2.5, there are some uncertainties associated with the chronic ESVs (more recent barium screening values (RIVM, 2020) are higher than the chronic ESV used in **Table 4-22**), the infrequent detections of the COPCs, and the depth at which porewater was collected (likely to be below the depth where most invertebrates are found). Therefore, it is expected that chronic risks due to porewater exposure are overestimated based on the evaluation of the detected porewater concentrations. Based on this evaluation, no porewater COPCs are retained and no further evaluation is warranted for benthic invertebrates exposed to porewater in this exposure area. It is noted that PCBs were analyzed for and not detected in porewater.

Potential risks to fish and aquatic invertebrates were assessed by evaluated COPC concentrations in surface water. The refined surface water comparison provided in **Table 4-21** identified HQs above 1 when chronic ESVs were considered but not when acute ESVs were considered. As described in Section 4.6.2.4, there are some uncertainties associated with the chronic ESVs (more recent barium screening values are higher than the value used in **Table 4-21**, the carbon disulfide ESV may be overly conservative). Therefore, it is expected that chronic risks to fish and aquatic invertebrates due to surface water exposure are overestimated based on the evaluation of the detected surface water concentrations. Based on this evaluation, no surface water COPCs are retained and no further evaluation is warranted for fish and aquatic invertebrates exposed to surface water in this exposure area.

Table 4-24 summarizes the HQs based on the NOAEL- and LOAEL-based TRVs used in the refined food web model. NOAEL-based HQs were above 1 for the insectivorous marsh wren (copper, lead, selenium, and Total PCBs) and short-tailed shrew (selenium and Total PCBs) and for the herbivorous meadow vole (selenium). This food web model assumed that these receptors obtained all of their diet only from earthworms or plants within this exposure area with no off-Site foraging or migration in the winter months. These assumptions are likely to overestimate risks for receptors which may consume a more varied diet and forage elsewhere. None of the LOAEL-based HQs were above 1.

Given the conservative nature of the food web model and the lack of LOAEL-based HQs above 1, the exposure media within the off-Project Red Maple Swamp/tidal stream area (surface soil, hydric soil, sediment) do not present an unacceptable risk of adverse effects to wildlife populations. Based on this evaluation, no COPCs are retained and no further evaluation is warranted for birds and mammals in this exposure area.

As summarized above, the only COPCs warranting further evaluation in this exposure area are Total PCBs in hydric soil and Total PCBs in sediment from the tidal stream. Additional evaluation of the sediment toxicity testing and macroinvertebrate community metrics from the tidal stream are provided in the following sub-sections.

4.6.4.2.1 Additional Characterization of PCBs in Hydric Soil and Tidal Stream Sediment

Total PCBs were retained as COPCs for invertebrates in hydric soil and tidal stream sediment based on comparisons to refined sediment ESVs. The probable effect-based sediment ESVs were based on freshwater probable effect concentrations (PECs; MacDonald, et al., 2000) and marine effects-range medians (ERMs; Buchman, 2008).

Table 4-25 presents a sample-by-sample comparison of the sediment and hydric soil concentrations relative to these refined ESVs. In general, PCB concentrations in the sediment are lower than in hydric soil and multiple individual samples exceed the PEC and/or ERM.

Recent work by National Oceanic and Atmospheric Administration (NOAA) on PCB toxicity to benthic invertebrates suggests that the bulk sediment-based screening values may be overly conservative. NOAA (2016) demonstrates that the use of a dose-response curve, rather than point estimates, may be more appropriate to quantify the benthic community risks due to PCBs. NOAA (2016) and Finkelstein et al. (2017) present dose response curves for Aroclor 1254 (as a surrogate for total PCBs) based on equilibrium partitioning (EqP) to estimate % injury to benthic invertebrates. A 10% injury to the benthic community was associated with 50.43 mg PCBs/kg organic carbon (OC) and 20% injury was associated with 89 mg PCBs/kg OC (see Table 5 in Finkelstein et al. [2017]).

In **Table 4-25**, the 10% injury concentration was adjusted to reflect the sample-specific TOC of the sediment and hydric soil samples (or the media-specific average when sample-specific TOC data were not available) and these sample-specific benchmarks were used to further evaluate the available PCB data. TOC concentrations ranged from 0.3% up to 44% and the associated 10% injury benchmarks ranged from 0.15 mg/kg to 22.2 mg/kg. Only the Total PCB concentration in the sample with the lowest TOC (SED 5 from 2011) exceeded the 10% injury benchmark. In the remaining samples, adverse impacts on the benthic community would not be expected. SED-335 was collected in 2019 from the same portion of the tidal stream where SED 5 was sampled in 2011 and the TOC level in the SED-335 was much higher (19%) than in SED 5.The average TOC level in the stream sediments was 9.3% so the SED 5 TOC level was unusually low and may not be representative of typical stream conditions.

The sediment and hydric soil results were also generally below sediment quality benchmarks reported by Fuchsman et al. (2006) and normalized to 1% TOC. These screening values were 2.1 mg/kg for Aroclor 1242, 4.9 mg/kg for Aroclor 1248, and 15 mg/kg for Aroclor 1254 (NOAA, 2016). Although screening values were not derived for Aroclor 1260 (the dominant Aroclor in sediment and hydric soil), based on the upward trend of screening values for the other Aroclors, a comparison against Aroclor 1254-based benchmarks is considered adequately protective. All of the sediment and hydric soil PCB results were below the Aroclor 1254 benchmark of 15 mg/kg at 1% TOC.

These results indicate that the risks to benthic receptors are overestimated by the screening level and refined ESVs considered in the SLERA and Step 3a and that risks to the benthic community in the hydric soil of the Red Maple Swamp and the sediment of the tidal stream due to exposure to PCBs are not expected above the USEPA's risk range.

Based on the review of the literature-based screening values, and the nature and extent of the exceedances, it is concluded that the benthic receptors in the off-Project Red Maple Swamp/tidal stream area are not at unacceptable risk due to exposure to PCBs. Alternate screening values identified by NOAA (2016) show that the bulk sediment based ESVs such as the PEC and ERM overestimate risks. When TOC is considered, PCB levels in sediment and hydric soil are below thresholds associated with significant risks to the benthic community.

4.6.4.2.2 Additional Characterization of Biological Sampling in the Tidal Stream

As described in Section 4.6.2.3, sediment toxicity testing and macroinvertebrate community sampling were conducted in May 2020 and the results are summarized in **Tables 4-19 and 4-20**, respectively. Statistical comparisons of toxicity testing endpoints identified differences between some individual off-Project tidal stream samples and individual background/reference samples or laboratory control results. Results for macroinvertebrates community metrics varied with no identified spatial pattern.

A series of statistical correlations were conducted using co-located toxicity testing results, macroinvertebrate community survey results, and sediment chemistry to evaluate the relationships between stressors (e.g., chemicals in sediment) and adverse impact on the biological community. **Attachment J-1** provides a brief summary of the approach and the findings with exports from the statistical software. Parameters selected for the correlation analysis included TOC, % fines (silt + clay), the (∑SEM-AVS)/foc, HQs based on the probable effect ESVs for HMW PAHs and LMW PAHs, freshwater PEC-Quotients (PEC-Qs), and marine ERM-Quotients (ERM-Qs). PEC-Qs and ERM-Qs

were calculated for metals (as the mean PEC-Q or ERM-Q for metals with PECs and ERMs), Total PAHs, and Total PCBs.

The average of the mean PEC-Q for metals, the PEC-Q for Total PAHs, and the PEC-Q for Total PCBs was also included as a value representing metals and organic stressors (referred to as Mean of Total PAHs, Total PCBs, and Mean Metals PEC-Qs). A similar mean ERM-Q was also derived for metals, PAHs, and PCBs (referred to as Mean of Total PAHs, Total PCBs, and Mean Metals ERM-Qs).

A total of five endpoints from the toxicity tests, four macroinvertebrate community metrics, and 17 chemical and physical parameters were subject to a correlation test (Spearman's Rho) to assess if biological responses were related to sediment chemistry or physical data. As summarized in **Attachment J-1 Table 1**, no statistically significant ($p<0.05$) correlations were identified between the chemical or physical stressors and the biological responses. These results indicate an overall lack of correlation between invertebrate toxicity endpoints or macroinvertebrate metrics and chemical concentrations in sediment.

As an additional approach for characterizing potential risks to the benthic invertebrate community, a sediment quality triad evaluation (**Attachment J-2**) was conducted to determine if off-Project Red Maple Swamp/tidal stream sample results for sediment chemistry, toxicity testing, and biological community surveys are impacted compared to upstream reference/background conditions. A reference envelope approach was used for this evaluation to incorporate the spatial and temporal variation observed in the upstream background samples (Hunt et al., 2001). The sediment chemistry and biological results for the five samples located in the upstream background/reference area between Circuit Drive and outfall 025 were used to determine the reference envelope values.

Reference envelope values were derived as lower or upper limits for sediment chemistry, toxicity testing endpoints, and community survey metrics to represent reference conditions. The sediment quality triad approach identified by Chapman (1992) was used to evaluate the potential for sediment COPC-related impacts on the biological community. The sediment quality triad evaluation considered the following endpoints:

- Sediment chemistry – Mean of Total PAHs, Total PCBs, and Mean Metals PEC-Qs and Mean of Total PAHs, Total PCBs, and Mean Metals ERM-Qs as measures of potential adverse impacts based on freshwater and marine benchmarks, respectively
- Sediment Toxicity – Mean Biomass and Reproduction (as Mean Juveniles per Surviving Amphipod) as sensitive measures of impacts in the toxicity tests (these endpoints showed the most frequent individual statistical differences in **Table 4-19**)
- Benthic Macroinvertebrate Community – Total Richness, Total Density, and HBI as measures of diversity and pollution tolerance.

The findings for each element of the triad were interpreted based on a matrix provided by Chapman (1992) and are provided in **Table 4-26**. Based on the categories identified by Chapman (1992) and comparisons to reference envelope values, the sediment quality triad evaluation indicates that:

- None of the samples showed adverse impacts for all three elements of the triad.
- SED-333 did not show adverse impacts relative to the reference envelope values for any of the triad components which, according to Chapman (1992), provides "strong evidence that there is no pollution induced degradation."
- The remaining four samples showed an impact relative to the reference envelope values for at least one element of the triad but did not support an indication of COPC-related benthic invertebrate community impacts.
  - SED-331 and SED-335 showed impacts to the sediment chemistry and toxicity portions of the triad but not to the macroinvertebrate community.
  - SED-339 showed impacts to the toxicity portion of the triad (based on reproduction only) but not to sediment chemistry or macroinvertebrate community.
  - SED-337 showed impacts to the macroinvertebrate community portion of the triad (based on HBI only) but not to sediment chemistry or toxicity.

According to Chapman (1992), the findings for SED-331 and SED-335 suggest that "toxic chemicals are stressing the system." As indicated in **Table 4-17**, Total PCBs were the only COPC retained in the Step 3a refined screening for

tidal stream sediments. A review of Total PCB concentrations in **Table 4-25**, shows that PCBs were not detected in the SED-331 sample and the Total PCB concentration for SED-335 was 1.5 mg/kg (above the PEC and ERM, but well below the sample-specific 10% benthic injury benchmark). In addition, PCBs were analyzed for and not detected in total or dissolved phase porewater collected from five sediment locations in and near the tidal stream in 2011 (data presented in **Attachment A**). These results suggest that PCBs are not likely to be the cause of impacts at these locations (or other locations in the stream).

A review of the PEC-Q and ERM-Qs calculated in **Attachment J-1** show that the quotients based on metals and Total PAHs for these two samples were less than 1, suggesting that these chemicals are not likely to result in adverse impacts to the benthic community. In addition, the SEM, AVS, TOC analysis presented in **Table 4-18** indicated that the divalent metals were not likely to be bioavailable. These two samples did have among the highest TOC levels in the stream, 44% for SED-331 and 19% for SED-335, which suggests samples were collected from depositional areas. Although the sediment quality triad indicated the potential for COPC-related impacts, primarily related to PCBs, the PCB evaluation provided in **Table 4-25** and the lack of statistical correlations between biological responses and PCBs (or other chemical stressors) suggests that observed impacts are not related to Project-related chemicals.

4.6.4.3 Off-Project Narragansett Bay and Beachfront Area Risk Characterization

The assessment endpoints selected for the off-Project Narragansett Bay and Beachfront Area included the sustainability of local populations of benthic invertebrates/shellfish, fish, and aquatic invertebrates (Section 4.2.3).

No surface water COPCs for fish and aquatic invertebrates were identified for this exposure area. Potential risks to benthic invertebrates were assessed by evaluated COPC concentrations in surface sediment and porewater. The refined surface sediment comparison provided in **Table 4-17** did not identify COPCs with HQs above 1 when probable effects-based ESVs were considered.

The refined porewater evaluation presented in **Table 4-22** identified HQs above 1 when chronic ESVs were considered but not when acute ESVs were considered. As discussed in Section 4.6.2.5, there are some uncertainties associated with the chronic ESVs (more recent barium screening values are higher than the value used in **Table 4-22**), the infrequent detections of the COPCs, and the depth at which porewater was collected (likely to be below the depth where most invertebrates are found). Therefore, it is expected that chronic risks due to porewater exposure are overestimated based on the evaluation of the detected porewater concentrations.

Based on the evaluation of surface water (all non-detect), surface sediment, and porewater, no COPCs are retained and no further evaluation is warranted for benthic invertebrates/shellfish, fish, and aquatic invertebrates in this exposure area.

4.6.5 Step 3a Summary and Conclusions

The purpose of Step 3a was to reevaluate those COPCs that were retained in the initial screening process because of the use of overly conservative exposure scenarios. This reevaluation considered alternate EPCs based on the 95% UCL, rather than the maximum detected concentration, refined ESVs and TRVs based on a literature search and applicability to the Project, sediment toxicity testing and macroinvertebrate surveys from the tidal stream, and a discussion of the conservatism and uncertainties associated with several of the direct contact screening values.

Table 4-27 identifies the preliminary COPCs retained from the SLERA and re-evaluated in Step 3a and summarizes the FODs, maximum EPCs and HQs calculated in refined ESV comparisons and food web models. The findings are briefly summarized below:

- **On-Project Blue Beach Area** – No surface soil COPCs were retained based on the refined ESV screening; all COPCs were eliminated based on low FOD or HQs below 1. In the food web model, no HQs above 1 were calculated using the LOAEL-based TRV. The American robin and short-tailed shrew had HQs ranging up to 3.8 using the NOAEL-based TRVs and assuming that all food was obtained from the exposure area. Given the conservative nature of the food web model and the lack of LOAEL-based HQs above 1, the surface soil of the on-Project Blue Beach area does not present an unacceptable risk of adverse effects to wildlife populations.
    - Based on the evaluation of surface soil in the on-Project Blue Beach area, no COPCs are retained and no further evaluation is warranted for plants, soil invertebrates, birds or mammals in this exposure area.

- **Off-Project Red Maple Swamp/Tidal Stream Area** – Total PCBs in hydric soil and sediment were the only COPCs retained based on refined ESV screens. PCBs were further evaluated using EqP-based benchmarks identified by NOAA (2016) which indicate PCBs are not expected to pose an unacceptable risk to the benthic community. A sediment quality triad evaluation identified locations where at least one element of the triad was impacted, but the triad evaluation and supplemental correlation evaluations did not support an indication of COPC-related benthic invertebrate community impacts. COPCs in surface water and porewater were eliminated based on comparisons to chronic and acute ESVs, low FOD, and the uncertainties associated with the ESVs and detected concentrations.

  In the food web model, no HQs above 1 were calculated using the LOAEL-based TRV. The marsh wren, meadow vole, and short-tailed shrew had HQs ranging up to 4.5 using the NOAEL-based TRVs and assuming that all food was obtained from the exposure area. Given the conservative nature of the food web model and the lack of LOAEL-based HQs above 1, the exposure media within the off-Project Red Maple Swamp/tidal stream area (surface soil, hydric soil, sediment) do not present an unacceptable risk of adverse effects to wildlife populations.

  – Based on the evaluation of surface soil, surface hydric soil, surface sediment, surface water, and porewater in the off-Project Red Maple Swamp/tidal stream area, no COPCs are retained and no further evaluation is warranted for plants, soil invertebrates, benthic invertebrates/shellfish, fish, aquatic invertebrates, birds or mammals in this exposure area.

- **Off-Project Narragansett Bay and Beachfront Area** - No surface sediment COPCs were retained based on the refined ESV screening; all COPCs were eliminated based on HQs below 1. COPCs were not identified for surface water in the SLERA based on a lack of detected chemicals. COPCs in porewater were eliminated based on comparisons to chronic and acute ESVs, low FOD, and a discussion of the uncertainties associated with the ESVs and detected concentrations.

  – Based on the evaluation of surface sediment, surface water, and porewater in the off-Project Narragansett Bay and Beachfront area, no COPCs are retained and no further evaluation is warranted for benthic invertebrates/shellfish, fish, or aquatic invertebrates in this exposure area.

Based on the results of the Step 3a evaluation, no COCs were identified for further ecological risk evaluation under CERCLA.

5. Summary and Conclusions

The baseline HHRA and ERA were conducted in support of the RI for the Blue Beach Disposal Area FUDS in North Kingstown, Rhode Island to evaluate potential human health and ecological effects of exposures to chemicals in soil, hydric soil, groundwater, porewater, sediment, and surface water in the Project and/or adjacent off-Project areas, and to determine whether Project-related chemicals in these areas pose a potential cancer risk or noncancer hazard above target levels to human health or the environment. Summaries of the HHRA and ERA are provided separately in this section.

5.1 Human Health Risk Assessment

The purpose of the HHRA is to evaluate whether exposure to Project-related COPCs pose a cancer risk and/or noncancer hazard to human health above USEPA target risk levels. The evaluation included performing a quantitative estimation of potential cancer risk and noncancer hazard to current and potential future human receptors that may come into contact with Site-related chemicals in environmental media within the on-Project Blue Beach area and off-Project areas (i.e., Off-Project Red Maple Swamp/tidal stream area and off-Project Narragansett Bay and Beachfront area), as applicable. The HHRA was conducted in accordance with CERCLA risk assessment guidance and the Project-specific RAWP provided in the SAP (Mabbett, 2019).

The HHRA evaluated potentially complete exposure pathways for human receptors identified based on current and reasonable future land-use scenarios in accordance with the Site CSM. The HHRA quantitatively evaluated exposure to surface soil, subsurface soil groundwater (all depths), shallow groundwater, sediment, surface water, and soil vapor, as applicable, for an RME scenario. Based on the current and future land use, the following human receptors were evaluated in the HHRA:

- Current/Future Construction/Utility Worker
- Current/Future Outdoor Worker
- Current/Future Trespasser (adolescent)
- Current/Future Recreational User (adult/child)
- Future Indoor Worker

The HHRA evaluated the following exposure pathways, as applicable for each receptor:

- exposure to soil through incidental ingestion, dermal contact, and inhalation of fugitive dust and volatiles in outdoor air;
- exposure to shallow groundwater through incidental ingestion, dermal contact, and inhalation of volatiles in an excavation trench;
- exposure to hydric surface soil, sediment, and surface water in the off-Project Red Maple Swamp/tidal stream area through incidental ingestion and dermal contact; and
- exposure to soil vapor in the on-Project Blue Beach area via the vapor intrusion pathway.

A hypothetical future residential scenario, including use of groundwater as a source of potable water, was also conservatively evaluated in the HHRA to represent a UU/UE scenario for informational purposes and for use in a forthcoming FS, if needed. However, residential use is not a reasonably anticipated future use of the Site. There are currently no residents located on the Project area and it is not zoned for residential use. In the unlikely event that the Project area is converted to residential use in the future, it is not reasonable to expect that the residents would use groundwater as a potable water source. Groundwater underlying the Site is not used for drinking water or other potable use and there is an ELUR recorded on the deed that prohibits potable use of groundwater from the on-Project Blue Beach area. Additionally, based on its proximity to Narragansett Bay and wetlands, groundwater is likely to be brackish, and the extraction of groundwater to serve as a water source (or to treat) would likely draw additional saline water into the system and would, therefore, not be implementable.

The cumulative potential ELCR and noncancer HI for each exposure scenario were evaluated in comparison to USEPA's target risk range of 10^{-6} to 10^{-4} and target HI of 1 (per target organ). For each associated exposure scenario (i.e., area/receptor/medium) with a potential risk/HI above USEPA target levels, risk drivers were selected from those COPCs significantly contributing to an individual ELCR > 10^{-4} or target organ HI > 1 (at one significant figure), specifically, COPCs with an individual ELCR > 10^{-6} or HI > 1. These risk drivers are selected as COCs for the associated medium/receptor/exposure scenario.

A summary of the potential ELCR and HI results for each of the receptors evaluated in the HHRA is presented in **Table 3-11**. In summary, the conclusions of the HHRA indicate that the cumulative potential ELCRs do not exceed USEPA's target ELCR range of 10^{-6} to 10^{-4} and the total potential HIs per target endpoint do not exceed USEPA's target HI of 1 for the current/future construction worker, current/future outdoor worker, current/future trespasser, and future indoor worker in the on-Project Blue Beach area; or the current/future recreational user in the off-Project Red Maple Swamp/tidal stream area. Therefore, no COCs were identified for these receptors.

5.2 Ecological Risk Assessment

The purpose of the ERA is to evaluate the potential adverse environmental effects of Project-related COPCs on ecological receptors and resources at or near the Project. The ERA included a screening level ERA (SLERA), which is considered the first tier of the ecological risk process (i.e., Steps 1 and 2) and, in cases where the SLERA indicated sufficient potential ecological risk, the COPCs were further evaluated in a sub-tier of the BERA (referred to as Step 3a).

The ERA evaluated the following potentially complete exposure pathways for terrestrial receptors in the on-Project Blue Beach exposure area:

- Terrestrial Invertebrates – exposed to surface soil through ingestion and direct contact;
- Terrestrial Plants – exposed to surface soil through root uptake; and
- Birds and Mammals – exposed to surface soil through incidental ingestion and to food items which may have bioaccumulated Project-related COPCs.

The following exposure pathways were evaluated for the wetland portions of the off-Project Red Maple Swamp/tidal stream area:

- Soil Invertebrates – exposed to hydric soil through ingestion and direct contact;
- Wetland Plants – exposed to hydric soil through root uptake; and
- Birds and Mammals – exposed to surface soil, hydric soil, and sediment within the off-Project Red Maple Swamp/tidal stream area through incidental ingestion and to food items which may have bioaccumulated Project-related COPCs.

The following additional exposure pathways were evaluated for the aquatic portions of the Project found in the off-Project Red Maple Swamp/tidal stream area and off-Project Narragansett Bay and Beachfront area:

- Benthic Invertebrates – exposed to sediment and porewater through ingestion and direct contact; and
- Aquatic Fish and Invertebrates – exposed to surface water through ingestion and direct contact.

These exposure pathways were evaluated through the comparison of surface soil, hydric soil, sediment, surface water, and porewater analytical data to media-specific ESV and through conservative food web modeling to avian and mammalian receptors. Consistency with background conditions was also considered as part of the COPC selection process. As indicated in **Table 4-14**, the SLERA identified COPCs in all media and exposure areas. Therefore, the SLERA SMDP indicated that additional evaluation was warranted in Step 3a, the first step of the BERA.

The purpose of Step 3a is to reevaluate COPCs that were retained in the SLERA for further evaluation, and to identify and eliminate from further consideration those COPCs that were retained because of the use of conservative exposure scenarios. In Step 3a, the SLERA risk estimates were recalculated using less conservative but more realistic assumptions including refined EPCs, ESVs, and TRVs. Step 3a uses the same representative species and exposure pathways, but with refined, central tendency exposure assumptions to more realistically estimate the

potential risk to ecological receptors from COPCs that failed the conservative SLERA screening process. Additional field efforts conducted to support the evaluation of the benthic community in the tidal stream (i.e., SEM, AVS, TOC, sediment toxicity testing, macroinvertebrate community sampling) were also considered.

As summarized in **Table 4-27**, nearly all of the HQs based on the refined ESVs were less than 1 indicating no need for further evaluation for the majority of the COPCs. COPCs in surface water and porewater were eliminated based on comparisons to chronic and acute ESVs, low FOD, and a discussion of the uncertainties associated with the ESVs and detected concentrations.

In the food web models for the on-Project Blue Beach area and the off-Project Red Maple Swamp/tidal stream area, all of the LOAEL-based HQs were less than 1. NOAEL-based HQs were greater than 1 for some COPCs, primarily for insectivorous receptors, with a maximum HQ of 3.8 for lead (American Robin) in the on-Project Blue Beach area. Given the conservative nature of the food web models (small birds and mammals were assumed to obtain diet only from the exposure areas) and the lack of LOAEL-based HQs above 1, the COPC concentrations in these two exposure areas do not present an unacceptable risk of adverse effects to wildlife populations.

Total PCBs in hydric soil and sediment in the off-Project Red Maple Swamp/tidal stream area were the only COPCs retained based on refined ESV screens. PCBs were further evaluated using EqP-based benchmarks identified by NOAA (2016) which indicate PCBs are not expected to pose a risk to the benthic community. A sediment quality triad evaluation identified locations where at least one element of the triad was impacted, but the triad evaluation and supplemental correlation evaluations did not support an indication of COPC-related benthic invertebrate community impacts.

Based on the Step 3a evaluation of surface soil, surface hydric soil, surface sediment, surface water, and porewater in the on-Project Blue Beach area, the off-Project Red Maple Swamp/tidal stream area, and the off-Project Narragansett Bay and Beachfront area, no COPCs are retained and no further evaluation is warranted for plants, soil invertebrates, benthic invertebrates/shellfish, fish, aquatic invertebrates, birds or mammals in these exposure areas. No COCs were identified for further evaluation under CERCLA.

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Figures

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Former Blue Beach Disposal Area FUDS Project

SITE LOCATION MAP

North Kingstown, Rhode Island

Figure 1-1

Contract No. W912WJ-16-D-0004-0002

Drawn: KHC | Approved: AMG

Projection: WGS 1984 Web Mercator Aux. Sphere

Project No. R7063002.000 | Date: 6/11/2018

S:\STAFF\GIS\7056001.003_BlueBeach\Remedial_Investigation\figures\ExtraMaps\Figure_Exposure Areas.mxd

Legend
- Off-Project Narragansett Bay and Beachfront
- Off-Project Red Maple Swamp/tidal stream
- On-Project Blue Beach
- Kiefer Park FUDS Boundary

Note:
Solid lines indicate **SITE** areas

Dashed line area is not part of the site, but is shown for illustrative purposes

0 55 110 220 330 440 Feet

N

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Blue Beach Disposal Area FUDS Project
Risk Assessment Work Plan

Exposure Areas

North Kingstown, RI

Figure 2-2

Contract No.
Drawn: KEH Approved: AMG
Projection: RI State Plane, NAD83, ft
Proj. No.7056003 Date: 6/22/2016

S:\STAFF\GIS\7056001.003_BlueBeach\Remedial_Investigation\figures\Wetland_Forest_Resources.mxd KEH 2/1/2016

Legend

- Primary Roads
- Freshwater Lakes/Rivers
- Upland Forest Coniferous
- Upland Forest Deciduous
- Upland Forest Mixed
- Upland Shrubland
- Wetland Forest Coniferous
- Wetland Forest Deciduous
- Wetland Forest Mixed
- Wetland Freshwater Emergent
- Wetland Marine/Esturarine
- Blue Beach FUDS

Sources:
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0 0.05 0.1 0.2 Miles

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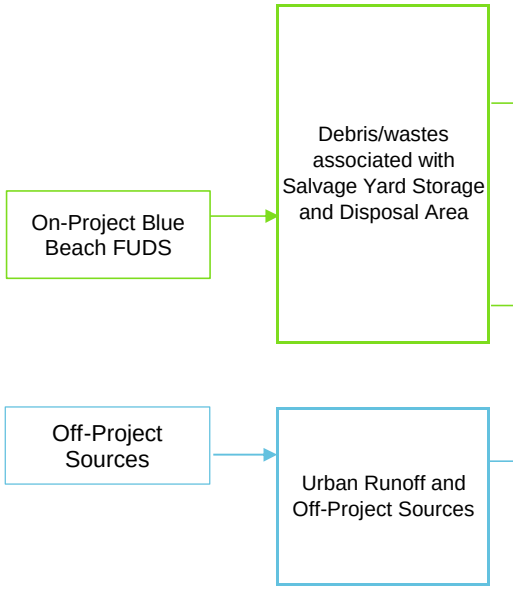
Blue Beach Disposal Area FUDS Project
Remedial Investigation/Feasibility Study

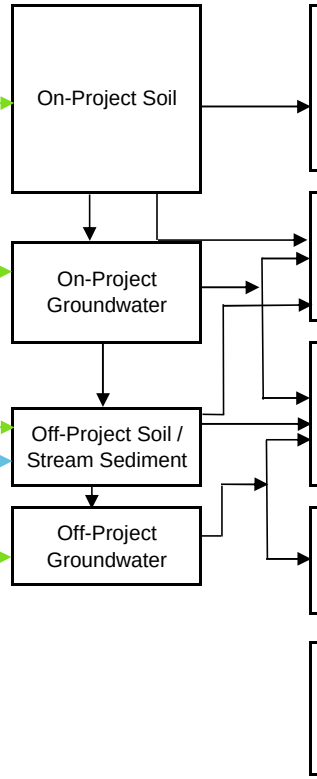
FOREST AND WETLAND RESOURCES

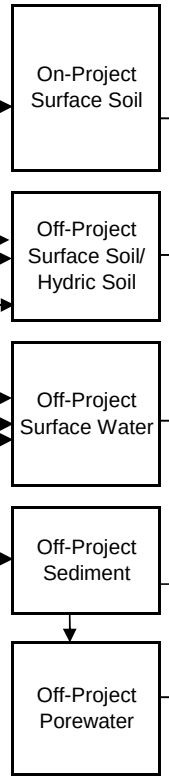
North Kingstown, Rhode Island

Figure No. 4-1

Contract No. W912WJ-11-D-0003	
Drawn: KEH	Approved: AMG
Projection: RI State Plane, NAD83, feet	
Proj. No. 7056003	Date: 2/1/2016







Potential Exposure Route	Potential Ecological Receptors/Exposure Pathways: Soil or Benthic Invertebrate Community	Terrestrial/ Wetland Plant Community	Fish and Aquatic Invertebrate Community	Avian and Mammalian Communities
Incidental Ingestion/Root Uptake	●	●		●(a)
Dermal/Direct Contact	●	●		o
Incidental Ingestion/Root Uptake	●	●		●(a,b)
Dermal/Direct Contact	●	●		o
Incidental Ingestion	●		●	
Dermal/Direct Contact	●		●	
Incidental Ingestion	●			●(a,b)
Dermal/Direct Contact	●			
Incidental Ingestion	●			
Dermal/Direct Contact	●			

Notes:
- Blank cell indicates pathway is not applicable.
- ● Potentially complete pathway.
- o Pathway considered to be incomplete or insignificant.
- → Potential release mechanism.

(a) Bioaccumulation pathway also expected to be a potentially complete.
(b) Wildlife receptors may be exposed to off-project surface soil, hydric soil, and sediment.

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FIGURE 4-2
ECOLOGICAL CONCEPTUAL SITE MODEL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Tables

TABLE 3-1
SELECTION OF EXPOSURE PATHWAYS
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/ Future	Soil	Surface Soil (0 - 1 feet)	On-Project Blue Beach Area	Construction/Utility Worker	Adult	Ingestion	Quant	Construction and/or utility activities may occur, leading to incidental ingestion of surface soil.
						Dermal	Quant	Construction and/or utility activities may occur, leading to direct contact with surface soil.
				Outdoor Worker	Adult	Ingestion	Quant	The site is located in an area designated for light industrial use; Outdoor workers may incidentally ingest surface soil while performing work outdoors.
						Dermal	Quant	The site is located in an area designated for light industrial use; Outdoor workers may come into contact with surface soil while performing work outdoors.
				Trespasser	Adolescent (ages 7-<16)	Ingestion	Quant	Trespassers may access the area and incidentally ingest surface soil.
						Dermal	Quant	Trespassers may access the area and come into contact with surface soil.
			Off-Project Red Maple Swamp/Tidal Stream Area (Walking Path)	Recreational User	Adult	Ingestion	Quant	Recreational users may incidentally ingest surface soil along the walking path while walking to/from the beach.
						Dermal	Quant	Recreational users may come into contact with surface soil along the walking path while walking to/from the beach.
					Child	Ingestion	Quant	Recreational users may incidentally ingest surface soil along the walking path while walking to/from the beach.
						Dermal	Quant	Recreational users may come into contact with surface soil along the walking path while walking to/from the beach.
		Subsurface Soil (1 - 15 feet) (a)	On-Project Blue Beach Area	Construction/Utility Worker	Adult	Ingestion	Quant	Construction and/or utility activities may occur, leading to incidental ingestion of subsurface soil.
						Dermal	Quant	Construction and/or utility activities may occur, leading to direct contact with subsurface soil.
		Fugitive Dust/Particulates and Volatiles Originating from Surface Soil (0 - 1 feet)	On-Project Blue Beach Area	Outdoor Worker	Adult	Inhalation	Quant	The site is located in an area designated for light industrial use; Outdoor workers may inhale airborne particulates/fugitive dust and volatiles originating from surface soil while performing work outdoors.
				Trespasser	Adolescent (ages 7-<16)	Inhalation	Quant	Trespassers may access the area and inhale airborne particulates/fugitive dust and volatiles originating from surface soil.
				Construction/Utility Worker	Adult	Inhalation	Quant	Construction and/or utility activities may occur, leading to inhalation of airborne particulates/fugitive dust and volatiles originating from surface soil.
			Off-Project Red Maple Swamp/Tidal Stream Area (Walking Path)	Recreational User	Adult	Inhalation	Quant	Recreational users may inhale airborne particulates/fugitive dust and volatiles originating from surface soil along the walking path while walking to/from the beach.
					Child	Inhalation	Quant	Recreational users may inhale airborne particulates/fugitive dust and volatiles originating from surface soil along the walking path while walking to/from the beach.
		Fugitive Dust/Particulates and Volatiles Originating from Subsurface Soil (1 - 15 feet) (a)	On-Project Blue Beach Area	Construction/Utility Worker	Adult	Inhalation	Quant	Construction and/or utility activities may occur, leading to inhalation of airborne particulates/fugitive dust and volatiles originating from subsurface soil.

TABLE 3-1
SELECTION OF EXPOSURE PATHWAYS
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/ Future	Hydric Soil	Surface Hydric Soil (0 - 1 feet)	Off-Project Red Maple Swamp/Tidal Stream Area	Recreational User	Adult	Ingestion	Quant	Recreational users may access this area and incidentally ingest hydric soil.
						Dermal	Quant	Recreational users may access this area and come into contact with hydric soil.
					Child	Ingestion	Quant	Recreational users may access this area and incidentally ingest hydric soil.
						Dermal	Quant	Recreational users may access this area and come into contact with hydric soil.
	Sediment	Sediment	Off-Project Red Maple Swamp/Tidal Stream Area	Recreational User	Adult	Ingestion	Quant	Recreational users may incidentally ingest sediment while wading.
						Dermal	Quant	Recreational users may come into contact with sediment while wading.
					Child	Ingestion	Quant	Recreational users may incidentally ingest sediment while wading.
						Dermal	Quant	Recreational users may come into contact with sediment while wading.
			Off-Project Narragansett Bay and Beachfront Area	Recreational User	Adult	Ingestion	Quant	Recreational users may incidentally ingest sediment while swimming.
						Dermal	Quant	Recreational users may come into contact with sediment while swimming.
					Child	Ingestion	Quant	Recreational users may incidentally ingest sediment while swimming.
						Dermal	Quant	Recreational users may come into contact with sediment while swimming.
	Surface Water	Surface Water	Off-Project Red Maple Swamp/Tidal Stream Area	Recreational User	Adult	Ingestion	None	Recreational users are not likely to incidentally ingest surface water while wading.
						Dermal	Quant	Recreational users may come into contact with surface water while wading.
					Child	Ingestion	None	Recreational users are not likely to incidentally ingest surface water while wading.
						Dermal	Quant	Recreational users may come into contact with surface water while wading.
			Off-Project Narragansett Bay and Beachfront Area	Recreational User	Adult	Ingestion	Quant	Recreational users may incidentally ingest surface water while swimming.
						Dermal	Quant	Recreational users may come into contact with surface water while swimming.
					Child	Ingestion	Quant	Recreational users may incidentally ingest surface water while swimming.
						Dermal	Quant	Recreational users may come into contact with surface water while swimming.
Future	Soil	Surface Soil (0 - 1 feet)	On-Project Blue Beach Area	Hypothetical Resident	Adult	Ingestion	Quant	Residents may incidentally ingest soil under a hypothetical future scenario in which the ELUR is removed and the area is redeveloped for residential use.
						Dermal	Quant	Residents may come into contact with soil under a hypothetical future scenario in which the ELUR is removed and area is redeveloped for residential use.
					Child	Ingestion	Quant	Residents may incidentally ingest soil under a hypothetical future scenario in which the area is redeveloped for residential use.
						Dermal	Quant	Residents may come into contact with soil under a hypothetical future scenario in which the area is redeveloped for residential use.
		Fugitive Dust/Particulates and Volatiles Originating from Surface Soil (0 - 1 feet)		Hypothetical Resident	Adult	Inhalation	Quant	Residents may inhale airborne particulates/fugitive dust and volatiles originating from soil under a hypothetical future scenario in which the ELUR is removed and the area is redeveloped for residential use.
					Child	Inhalation	Quant	Residents may inhale airborne particulates/fugitive dust and volatiles originating from soil under a hypothetical future scenario in which the area is redeveloped for residential use.

TABLE 3-1
SELECTION OF EXPOSURE PATHWAYS
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Soil	Subsurface Soil (1 - 15 feet) (a)	On-Project Blue Beach Area	Outdoor Worker	Adult	Ingestion	Quant	The site is located in an area designated for light industrial use; Outdoor workers may incidentally ingest subsurface soil while performing outdoor work under a potential future scenario in which it is brought to the surface as a result of redevelopment activities.
						Dermal	Quant	The site is located in an area designated for light industrial use; Outdoor workers may come into contact with subsurface soil while performing outdoor work under a potential future scenario in which it is brought to the surface as a result of redevelopment activities.
				Trespasser	Adolescent (ages 7-<16)	Ingestion	Quant	Trespassers may access the area and incidentally ingest subsurface soil under a potential future scenario in which it is brought to the surface as a result of redevelopment activities.
						Dermal	Quant	Trespassers may access the area and come into contact with subsurface soil under a potential future scenario in which it is brought to the surface as a result of redevelopment activities.
				Hypothetical Resident	Adult	Ingestion	Quant	Residents may incidentally ingest soil under a hypothetical future scenario in which the ELUR is removed and the area is redeveloped for residential use.
						Dermal	Quant	Residents may come into contact with soil under a hypothetical future scenario in which the ELUR is removed and area is redeveloped for residential use.
					Child	Ingestion	Quant	Residents may incidentally ingest soil under a hypothetical future scenario in which the area is redeveloped for residential use.
						Dermal	Quant	Residents may come into contact with soil under a hypothetical future scenario in which the area is redeveloped for residential use.
			Off-Project Red Maple Swamp/Tidal Stream Area (Walking Path) (c)	Recreational User	Adult	Ingestion	Quant	Recreational users may incidentally ingest subsurface soil along the walking path under a potential future scenario in which it is brought to the surface as a result of redevelopment activities.
						Dermal	Quant	Recreational users may come into contact with subsurface soil along the walking path under a potential future scenario in which it is brought to the surface as a result of redevelopment activities.
					Child	Ingestion	Quant	Recreational users may incidentally ingest subsurface soil along the walking path under a potential future scenario in which it is brought to the surface as a result of redevelopment activities.
						Dermal	Quant	Recreational users may come into contact with subsurface soil along the walking path under a potential future scenario in which it is brought to the surface as a result of redevelopment activities.
		Fugitive Dust/Particulates and Volatiles Originating from Subsurface Soil (1 - 15 feet) (a)	On-Project Blue Beach Area	Outdoor Worker	Adult	Inhalation	Quant	The site is located in an area designated for light industrial use; Outdoor workers may inhale airborne particulates/fugitive dust and volatiles originating from subsurface soil while performing work outdoors under a potential future scenario in which it is brought to the surface as a result of redevelopment activities.
				Trespasser	Adolescent (ages 7-<16)	Inhalation	Quant	Trespassers may access the area and inhale airborne particulates/fugitive dust and volatiles originating from subsurface soil under a potential future scenario in which it is brought to the surface as a result of redevelopment activities.
				Hypothetical Resident	Adult	Inhalation	Quant	Residents may inhale airborne particulates/fugitive dust and volatiles originating from soil under a hypothetical future scenario in which the ELUR is removed and the area is redeveloped for residential use.
					Child	Inhalation	Quant	Residents may inhale airborne particulates/fugitive dust and volatiles originating from soil under a hypothetical future scenario in which the area is redeveloped for residential use.
			Off-Project Red Maple Swamp/Tidal Stream Area (Walking Path) (c)	Recreational User	Adult	Inhalation	Quant	Recreational users may inhale airborne particulates/fugitive dust and volatiles originating from subsurface soil along the walking path under a potential future scenario in which it is brought to the surface as a result of redevelopment activities.
					Child	Inhalation	Quant	Recreational users may inhale airborne particulates/fugitive dust and volatiles originating from subsurface soil along the walking path under a potential future scenario in which it is brought to the surface as a result of redevelopment activities.

TABLE 3-1
SELECTION OF EXPOSURE PATHWAYS
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Hydric Soil	Subsurface Hydric Soil (1 - 2 feet)	Off-Project Red Maple Swamp/Tidal Stream Area	Recreational User	Adult	Ingestion	Quant	Redevelopment activities are not considered to occur in this area; therefore, hydric subsurface soil is not likely to be available for exposure. However, hydric subsurface soil was evaluated through the COPC selection and EPC calculation steps of the HHRA.
						Dermal	Quant	Redevelopment activities are not considered to occur in this area; therefore, hydric subsurface soil is not likely to be available for exposure. However, hydric subsurface soil was evaluated through the COPC selection and EPC calculation steps of the HHRA.
					Child	Ingestion	Quant	Redevelopment activities are not considered to occur in this area; therefore, hydric subsurface soil is not likely to be available for exposure. However, hydric subsurface soil was evaluated through the COPC selection and EPC calculation steps of the HHRA.
						Dermal	Quant	Redevelopment activities are not considered to occur in this area; therefore, hydric subsurface soil is not likely to be available for exposure. However, hydric subsurface soil was evaluated through the COPC selection and EPC calculation steps of the HHRA.
	Groundwater	Shallow Groundwater (b)	On-Project Blue Beach Area	Construction/Utility Worker	Adult	Ingestion	Quant	Construction and/or utility activities may occur, leading to incidental ingestion of shallow groundwater.
						Dermal	Quant	Construction and/or utility activities may occur, leading to direct contact with shallow groundwater.
		Trench Air				Inhalation	Quant	Construction and/or utility activities may occur, leading to inhalation of volatiles originating from shallow groundwater that accumulates in an excavation trench.
		Groundwater	On-Project Blue Beach Area	Hypothetical Resident	Adult	Ingestion	Quant	Residents may ingest groundwater as drinking water under a hypothetical future scenario in which the ELUR is removed and the area is redeveloped for residential use.
						Dermal	Quant	Residents may come into contact with groundwater used for bathing/showering under a hypothetical future scenario in which the ELUR is removed and the area is redeveloped for residential use.
					Child	Ingestion	Quant	Residents may ingest groundwater as drinking water under a hypothetical future scenario in which the ELUR is removed and the area is redeveloped for residential use.
						Dermal	Quant	Residents may come into contact with groundwater used for bathing/showering under a hypothetical future scenario in which the ELUR is removed and the area is redeveloped for residential use.
		Shower Air	On-Project Blue Beach Area	Hypothetical Resident	Adult	Inhalation	Quant	Residents may inhale volatiles originating from groundwater used for bathing/showering under a hypothetical future scenario in which the ELUR is removed and the area is redeveloped for residential use.
					Child	Inhalation	Quant	Residents may inhale volatiles originating from groundwater used for bathing/showering under a hypothetical future scenario in which the ELUR is removed and the area is redeveloped for residential use.
	Soil Vapor	Indoor Air	On-Project Blue Beach Area	Hypothetical Resident	Adult	Inhalation	Quant	Residents may inhale volatiles in indoor air originating from soil vapor, via the vapor intrusion pathway, under a hypothetical future scenario in which the ELUR is removed and the area is redeveloped for residential use.
					Child	Inhalation	Quant	
				Indoor Worker	Adult	Inhalation	Quant	Current buildings have vapor barriers installed making the vapor intrusion pathway incomplete under a current scenario. Future indoor workers may inhale volatiles in indoor air originating from soil vapor, via the vapor intrusion pathway, under a hypothetical future scenario in which new commercial/industrial buildings are constructed without vapor intrusion mitigation systems.

Notes:
ELUR - Environmental land-use restriction; An ELUR prohibiting residential use and potable use of groundwater within the on-Project Blue Beach Area has been recorded. However, this scenario is being evaluated to represent a unlimited use/unrestricted exposure (UU/UE) scenario for informational purposes. See further discussion in the report text.
None - Exposure scenario is considered incomplete or insignificant and is not quantitatively evaluated in the human health risk assessment.
Quant - Exposures quantitatively evaluated in the human health risk assessment.
(a) This soil depth interval includes one soil sample collected from a depth of 14.25 to 15.5 feet below ground surface.
(b) Shallow groundwater is defined in this Human Health Risk Assessment as the top 15 feet below ground surface. However, three samples with a sampling interval of less than 15 feet to 16 feet below ground surface were also included as being representative of shallow groundwater.
(c) This scenario includes two soil samples in the Red Maple Swamp/tidal stream area to the west of the walking path.

TABLE 3-2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil (0 - 1 foot)

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)	Industrial RSL (NC/C) (8)	Exceed Industrial RSL? (Y/N)
On-Project		**Inorganics**																
Blue Beach Area	7429-90-5	Aluminum	2.81E+03	1.19E+04	mg/kg	SB-319 (0 - 1 ft)	27 / 27	-	1.19E+04	7.70E+03 NC	N/A	N/A	Y	ASL	1.39E+04	N	1.10E+05 NC	N
	7440-36-0	Antimony	2.80E-02 J	3.14E+00	mg/kg	SB-BG-1 (0 - 1 ft)	27 / 27	-	3.14E+00	3.10E+00 NC	N/A	N/A	Y	ASL	1.40E-01	Y	4.70E+01 NC	N
	7440-38-2	Arsenic	1.30E+00	4.39E+00	mg/kg	SB-303 (0 - 1 ft)	27 / 27	-	4.39E+00	6.80E-01 C	N/A	N/A	Y	ASL	5.97E+00	N	3.00E+00 C	Y
	7440-39-3	Barium	6.09E+00	5.20E+01	mg/kg	SB-311 (0 - 1 ft)	27 / 27	-	5.20E+01	1.50E+03 NC	N/A	N/A	N	BSL	N/A	N/A	2.20E+04 NC	N
	7440-41-7	Beryllium	3.22E-01	4.42E+00	mg/kg	SB-321 (0 - 1 ft)	27 / 27	-	4.42E+00	1.60E+01 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+02 NC	N
	7440-43-9	Cadmium	1.60E-02 J	1.20E+01	mg/kg	SB-BG-1 (0 - 1 ft)	26 / 27	0.016 - 0.016	1.20E+01	7.10E+00 NC	N/A	N/A	Y	ASL	1.42E-01	Y	9.80E+01 NC	N
	7440-70-2	Calcium	2.16E+02	2.66E+04	mg/kg	SB-311 (0 - 1 ft)	27 / 27	-	2.66E+04	EN	N/A	N/A	N	NUT	N/A	N/A	EN	N
	7440-47-3	Chromium	3.53E+00	3.64E+01	mg/kg	SB-BG-1 (0 - 1 ft)	27 / 27	-	3.64E+01	1.20E+04 NC	N/A	N/A	N	BSL	N/A	N/A	1.80E+05 NC	N
	7440-48-4	Cobalt	1.30E+00	7.57E+00	mg/kg	SB-321 (0 - 1 ft)	27 / 27	-	7.57E+00	2.30E+00 NC	N/A	N/A	Y	ASL	5.85E+00	Y	3.50E+01 NC	N
	7440-50-8	Copper	2.99E+00	1.16E+02	mg/kg	SB-321 (0 - 1 ft)	27 / 27	-	1.16E+02	3.10E+02 NC	N/A	N/A	N	BSL	N/A	N/A	4.70E+03 NC	N
	7439-89-6	Iron	4.24E+03	1.46E+04	mg/kg	SB-316 (0 - 1 ft)	27 / 27	-	1.46E+04	5.50E+03 NC	N/A	N/A	Y	ASL	1.83E+04	N	8.20E+04 NC	N
	7439-92-1	Lead	7.10E+00	3.83E+02	mg/kg	SB-302 (0 - 1 ft)	27 / 27	-	3.83E+02	4.00E+02 L	N/A	N/A	N	BSL	N/A	N/A	8.00E+02 L	N
	7439-95-4	Magnesium	5.26E+02	2.08E+03	mg/kg	SB-311 (0 - 1 ft)	27 / 27	-	2.08E+03	EN	N/A	N/A	N	NUT	N/A	N/A	EN	N
	7439-96-5	Manganese	5.46E+01	2.48E+02	mg/kg	SB-323 (0 - 1 ft)	27 / 27	-	2.48E+02	1.80E+02 NC	N/A	N/A	Y	ASL	2.19E+02	Y	2.60E+03 NC	N
	7439-97-6	Mercury	9.20E-03 J	2.14E+00	mg/kg	SB-BG-1 (0 - 1 ft)	21 / 27	0.014 - 0.017	2.14E+00	2.30E+00 NC	N/A	N/A	N	BSL	N/A	N/A	3.50E+01 NC	N
	7440-02-0	Nickel	2.65E+00	6.77E+01	mg/kg	SB-321 (0 - 1 ft)	27 / 27	-	6.77E+01	1.50E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.20E+03 NC	N
	7440-09-7	Potassium	2.29E+02	1.16E+03	mg/kg	SB-323 (0 - 1 ft)	27 / 27	-	1.16E+03	EN	N/A	N/A	N	NUT	N/A	N/A	EN	N
	7782-49-2	Selenium	8.00E-02 J	4.60E-01	mg/kg	SB-310 (0 - 1 ft)	27 / 27	-	4.60E-01	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A	5.80E+02 NC	N
	7440-22-4	Silver	2.10E-02 J	1.15E+01 J	mg/kg	SB-302 (0 - 1 ft)	26 / 27	0.031 - 0.031	1.15E+01	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A	5.80E+02 NC	N
	7440-23-5	Sodium	2.14E+01 J	8.34E+01	mg/kg	SB-321 (0 - 1 ft)	20 / 27	27 - 38	8.34E+01	EN	N/A	N/A	N	NUT	N/A	N/A	EN	N
	7440-28-0	Thallium	3.30E-02 J	1.33E-01	mg/kg	SB-323 (0 - 1 ft)	27 / 27	-	1.33E-01	7.80E-02 NC	N/A	N/A	Y	ASL	1.78E-01	N	1.20E+00 NC	N
	7440-62-2	Vanadium	5.31E+00	1.55E+01	mg/kg	SB-319 (0 - 1 ft)	27 / 27	-	1.55E+01	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A	5.80E+02 NC	N
	7440-66-6	Zinc	2.65E+01	4.25E+02	mg/kg	SB-321 (0 - 1 ft)	27 / 27	-	4.25E+02	2.30E+03 NC	N/A	N/A	N	BSL	N/A	N/A	3.50E+04 NC	N
		PCBs																
	Tot-PCB-ARO	Total PCB Aroclors	2.30E-01	4.80E-01	mg/kg	ISM-BG1	3 / 3	-	4.80E-01	1.20E-01 NC	N/A	N/A	Y	ASL	N/A	N/A	9.70E-01 C	N
		SVOCs																
	90-12-0	1-Methylnaphthalene	2.20E-03 J	4.10E-02	mg/kg	SB-310 (0 - 1 ft)	14 / 27	0.0086 - 0.011	4.10E-02	1.80E+01 C	N/A	N/A	N	BSL	N/A	N/A	7.30E+01 C	N
	91-57-6	2-Methylnaphthalene	2.40E-03 J	7.10E-02	mg/kg	SB-322 (0 - 1 ft)	20 / 27	0.0086 - 0.011	7.10E-02	2.40E+01 NC	N/A	N/A	N	BSL	N/A	N/A	3.00E+02 NC	N
	83-32-9	Acenaphthene	5.00E-03 J	3.55E-02	mg/kg	SB-301 (0 - 1 ft)	5 / 27	0.0086 - 0.011	3.55E-02	3.60E+02 NC	N/A	N/A	N	BSL	N/A	N/A	4.50E+03 NC	N
	120-12-7	Anthracene	1.10E-03 J	6.55E-02	mg/kg	SB-301 (0 - 1 ft)	23 / 27	0.01 - 0.011	6.55E-02	1.80E+03 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+04 NC	N
	56-55-3	Benzo(a)anthracene	3.20E-03 J	4.00E-01	mg/kg	SB-311 (0 - 1 ft)	24 / 27	0.01 - 0.01	4.00E-01	1.10E+00 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+01 C	N
	50-32-8	Benzo(a)Pyrene	3.80E-03 J	5.00E-01	mg/kg	SB-311 (0 - 1 ft)	26 / 27	0.01 - 0.01	5.00E-01	1.10E-01 C	N/A	N/A	Y	ASL	2.25E-01	Y	2.10E+00 C	N
	205-99-2	Benzo(b)fluoranthene	5.50E-03 J	8.00E-01	mg/kg	SB-311 (0 - 1 ft)	27 / 27	-	8.00E-01	1.10E+00 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+01 C	N
	191-24-2	Benzo(g,h,i)Perylene	5.60E-03 J	3.60E-01	mg/kg	SB-311 (0 - 1 ft)	25 / 27	0.01 - 0.01	3.60E-01	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+03 NC	N
	207-08-9	Benzo(k)Fluoranthene	4.40E-03 J	2.70E-01	mg/kg	SB-311 (0 - 1 ft)	26 / 27	0.01 - 0.01	2.70E-01	1.10E+01 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+02 C	N
	65-85-0	Benzoic acid	5.00E+00 J	5.00E+00 J	mg/kg	SB-301 (0 - 1 ft)	1 / 26	0.53 - 0.7	5.00E+00	2.50E+04 NC	N/A	N/A	N	BSL	N/A	N/A	3.30E+05 NC	N
	117-81-7	Bis-(2-Ethylhexyl)-Phthalate	1.50E-01 J	8.60E-01	mg/kg	SB-BG-1 (0 - 1 ft)	4 / 27	0.21 - 0.28	8.60E-01	3.90E+01 C	N/A	N/A	N	BSL	N/A	N/A	1.60E+02 C	N
	218-01-9	Chrysene	3.10E-03 J	4.70E-01	mg/kg	SB-311 (0 - 1 ft)	27 / 27	-	4.70E-01	1.10E+02 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+03 C	N
	53-70-3	Dibenzo(a,h)Anthracene	2.70E-03 J	1.30E-01	mg/kg	SB-311 (0 - 1 ft)	24 / 27	0.0086 - 0.01	1.30E-01	1.10E-01 C	N/A	N/A	Y	ASL	2.99E-02	Y	2.10E+00 C	N
	206-44-0	Fluoranthene	3.10E-03 J	6.10E-01 J	mg/kg	SB-305 (0 - 1 ft)	26 / 27	0.01 - 0.01	6.10E-01	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A	3.00E+03 NC	N
	86-73-7	Fluorene	3.40E-03 J	3.50E-02	mg/kg	SB-301 (0 - 1 ft)	11 / 27	0.0086 - 0.011	3.50E-02	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A	3.00E+03 NC	N

TABLE 3-2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil (0 - 1 foot)

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)	Industrial RSL (NC/C) (8)	Exceed Industrial RSL? (Y/N)
On-Project	193-39-5	Indeno(1,2,3-CD)Pyrene	6.10E-03 J	3.90E-01	mg/kg	SB-311 (0 - 1 ft)	23 / 27	0.01 - 0.01	3.90E-01	1.10E+00 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+01 C	N
Blue Beach Area	91-20-3	Naphthalene	2.80E-03 J	4.10E-02	mg/kg	SB-310 (0 - 1 ft)	8 / 27	0.0086 - 0.011	4.10E-02	2.00E+00 C	N/A	N/A	N	BSL	N/A	N/A	8.60E+00 C	N
	85-01-8	Phenanthrene	2.20E-03 J	3.70E-01	mg/kg	SB-305 (0 - 1 ft)	27 / 27	-	3.70E-01	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+03 NC	N
	129-00-0	Pyrene	2.60E-03 J	6.00E-01	mg/kg	SB-311 (0 - 1 ft)	27 / 27	-	6.00E-01	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+03 NC	N
		VOCs																
	78-93-3	2-Butanone (MEK)	9.80E-03 J	9.80E-03 J	mg/kg	SB-324 (0 - 1 ft)	1 / 20	0.0099 - 0.012	9.80E-03	2.70E+03 NC	N/A	N/A	N	BSL	N/A	N/A	1.90E+04 NC	N
	99-87-6	4-Isopropyltoluene	6.80E-04 J	7.20E-03 J	mg/kg	SB-320 (0 - 1 ft)	4 / 20	0.0022 - 0.0025	7.20E-03	1.90E+02 NC	N/A	N/A	N	BSL	N/A	N/A	9.90E+02 NC	N
	67-64-1	Acetone	7.90E-03 J	3.90E-01 J	mg/kg	SB-324 (0 - 1 ft)	13 / 20	0.0099 - 0.012	3.90E-01	6.10E+03 NC	N/A	N/A	N	BSL	N/A	N/A	6.70E+04 NC	N
	75-15-0	Carbon Disulfide	7.80E-04 J	8.60E-04 J	mg/kg	SB-324 (0 - 1 ft)	2 / 20	0.002 - 0.0025	8.60E-04	7.70E+01 NC	N/A	N/A	N	BSL	N/A	N/A	3.50E+02 NC	N
	108-88-3	Toluene	1.30E-03 J	3.80E-03 J	mg/kg	SB-311; SB-318 (0 - 1 ft)	11 / 20	0.002 - 0.0025	3.80E-03	4.90E+02 NC	N/A	N/A	N	BSL	N/A	N/A	4.70E+03 NC	N
	79-01-6	Trichloroethylene	6.50E-04 J	4.10E-03 J	mg/kg	SB-307 (0 - 1 ft)	4 / 20	0.0022 - 0.0025	4.10E-03	4.10E-01 NC	N/A	N/A	N	BSL	N/A	N/A	1.90E+00 NC	N
Off-Project		**Inorganics**																
Red Maple	7429-90-5	Aluminum	2.66E+03	6.64E+03	mg/kg	SB-329 (0 - 1 ft)	10 / 10	-	6.64E+03	7.70E+03 NC	N/A	N/A	N	BSL	N/A	N/A	1.10E+05 NC	N
Swamp / Tidal	7440-36-0	Antimony	2.90E-02 J	1.58E-01	mg/kg	SB-333 (0 - 1 ft)	10 / 10	-	1.58E-01	3.10E+00 NC	N/A	N/A	N	BSL	N/A	N/A	4.70E+01 NC	N
Stream Area	7440-38-2	Arsenic	9.90E-01	4.20E+00	mg/kg	SS-6A; SS-3A (0 - 1 ft)	16 / 16	-	4.20E+00	6.80E-01 C	N/A	N/A	Y	ASL	5.97E+00	N	3.00E+00 C	Y
	7440-39-3	Barium	4.27E+00	3.24E+01	mg/kg	SB-331 (0 - 1 ft)	16 / 16	-	3.24E+01	1.50E+03 NC	N/A	N/A	N	BSL	N/A	N/A	2.20E+04 NC	N
	7440-41-7	Beryllium	2.60E-01	6.29E-01	mg/kg	SB-332 (0 - 1 ft)	10 / 10	-	6.29E-01	1.60E+01 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+02 NC	N
	7440-43-9	Cadmium	2.70E-02 J	2.93E-01	mg/kg	SB-333 (0 - 1 ft)	12 / 16	0.5 - 0.5	2.93E-01	7.10E+00 NC	N/A	N/A	N	BSL	N/A	N/A	9.80E+01 NC	N
	7440-70-2	Calcium	3.35E+02	1.24E+03	mg/kg	SB-330 (0 - 1 ft)	10 / 10	-	1.24E+03	EN	N/A	N/A	N	NUT	N/A	N/A	EN	N
	7440-47-3	Chromium	2.57E+00	1.36E+01	mg/kg	SB-329 (0 - 1 ft)	16 / 16	-	1.36E+01	1.20E+04 NC	N/A	N/A	N	BSL	N/A	N/A	1.80E+05 NC	N
	7440-48-4	Cobalt	1.49E+00	4.15E+00	mg/kg	SB-329 (0 - 1 ft)	10 / 10	-	4.15E+00	2.30E+00 NC	N/A	N/A	Y	ASL	5.85E+00	N	3.50E+01 NC	N
	7440-50-8	Copper	2.82E+00	1.07E+01	mg/kg	SB-329 (0 - 1 ft)	10 / 10	-	1.07E+01	3.10E+02 NC	N/A	N/A	N	BSL	N/A	N/A	4.70E+03 NC	N
	7439-89-6	Iron	4.48E+03	1.09E+04	mg/kg	SB-329 (0 - 1 ft)	10 / 10	-	1.09E+04	5.50E+03 NC	N/A	N/A	Y	ASL	1.83E+04	N	8.20E+04 NC	N
	7439-92-1	Lead	9.00E+00	3.78E+01	mg/kg	SB-333 (0 - 1 ft)	16 / 16	-	3.78E+01	4.00E+02 L	N/A	N/A	N	BSL	N/A	N/A	8.00E+02 L	N
	7439-95-4	Magnesium	5.00E+02	4.37E+03	mg/kg	SB-329 (0 - 1 ft)	10 / 10	-	4.37E+03	EN	N/A	N/A	N	NUT	N/A	N/A	EN	N
	7439-96-5	Manganese	6.09E+01	1.97E+02	mg/kg	SB-331 (0 - 1 ft)	10 / 10	-	1.97E+02	1.80E+02 NC	N/A	N/A	Y	ASL	2.19E+02	N	2.60E+03 NC	N
	7439-97-6	Mercury	9.10E-03 J	4.90E-02	mg/kg	SS-1A (0 - 1 ft)	13 / 16	0.031 - 0.036	4.90E-02	2.30E+00 NC	N/A	N/A	N	BSL	N/A	N/A	3.50E+01 NC	N
	7440-02-0	Nickel	2.26E+00	2.25E+01	mg/kg	SB-329 (0 - 1 ft)	10 / 10	-	2.25E+01	1.50E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.20E+03 NC	N
	7440-09-7	Potassium	2.42E+02	1.66E+03	mg/kg	SB-331 (0 - 1 ft)	10 / 10	-	1.66E+03	EN	N/A	N/A	N	NUT	N/A	N/A	EN	N
	7782-49-2	Selenium	7.20E-02 J	2.00E-01 J	mg/kg	SB-329 (0 - 1 ft)	10 / 16	4.7 - 5.3	2.00E-01	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A	5.80E+02 NC	N
	7440-22-4	Silver	2.20E-02 J	1.84E-01	mg/kg	SB-331 (0 - 1 ft)	10 / 16	0.5 - 0.5	1.84E-01	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A	5.80E+02 NC	N
	7440-28-0	Thallium	6.50E-02 J	1.10E-01	mg/kg	SB-331 (0 - 1 ft)	4 / 10	0.024 - 0.038	1.10E-01	7.80E-02 NC	N/A	N/A	Y	ASL	1.78E-01	N	1.20E+00 NC	N
	7440-62-2	Vanadium	5.55E+00	1.47E+01	mg/kg	SB-332 (0 - 1 ft)	10 / 10	-	1.47E+01	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A	5.80E+02 NC	N
	7440-66-6	Zinc	1.54E+01	9.23E+01	mg/kg	SB-329 (0 - 1 ft)	10 / 10	-	9.23E+01	2.30E+03 NC	N/A	N/A	N	BSL	N/A	N/A	3.50E+04 NC	N
		PCBs																
	Tot-PCB-ARO	Total PCB Aroclors	1.10E-01	2.50E-01	mg/kg	SB-329 (0 - 1 ft)	3 / 9	0.058 - 0.069	2.50E-01	1.20E-01 NC	N/A	N/A	Y	ASL	N/A	N/A	9.70E-01 C	N

TABLE 3-2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil (0 - 1 foot)

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)	Industrial RSL (NC/C) (8)	Exceed Industrial RSL? (Y/N)
Off-Project		**SVOCs**																
Red Maple	90-12-0	1-Methylnaphthalene	2.50E-03 J	3.10E-02	mg/kg	SB-330 (0 - 1 ft)	5 / 10	0.0094 - 0.011	3.10E-02	1.80E+01 C	N/A	N/A	N	BSL	N/A	N/A	7.30E+01 C	N
Swamp / Tidal	91-57-6	2-Methylnaphthalene	3.50E-03 J	6.50E-02	mg/kg	SB-330 (0 - 1 ft)	6 / 10	0.0094 - 0.01	6.50E-02	2.40E+01 NC	N/A	N/A	N	BSL	N/A	N/A	3.00E+02 NC	N
Stream Area	83-32-9	Acenaphthene	7.00E-03 J	1.30E-02 J	mg/kg	SB-331 (0 - 1 ft)	2 / 10	0.0094 - 0.011	1.30E-02	3.60E+02 NC	N/A	N/A	N	BSL	N/A	N/A	4.50E+03 NC	N
	208-96-8	Acenaphthylene	9.80E-03 J	1.03E-01 J	mg/kg	SB-330 (0 - 1 ft)	3 / 10	0.0094 - 0.011	1.03E-01	3.60E+02 NC	N/A	N/A	N	BSL	N/A	N/A	4.50E+03 NC	N
	120-12-7	Anthracene	3.10E-03 J	2.76E-01 J	mg/kg	SB-330 (0 - 1 ft)	6 / 10	0.0094 - 0.01	2.76E-01	1.80E+03 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+04 NC	N
	56-55-3	Benzo(a)anthracene	4.60E-03 J	2.10E+00	mg/kg	SB-330 (0 - 1 ft)	10 / 10	-	2.10E+00	1.10E+00 C	N/A	N/A	Y	ASL	2.34E-01	Y	2.10E+01 C	N
	50-32-8	Benzo(a)Pyrene	7.30E-03 J	2.10E+00 J	mg/kg	SB-330 (0 - 1 ft)	10 / 10	-	2.10E+00	1.10E-01 C	N/A	N/A	Y	ASL	2.25E-01	Y	2.10E+00 C	N
	205-99-2	Benzo(b)fluoranthene	9.50E-03 J	2.20E+00	mg/kg	SB-330 (0 - 1 ft)	10 / 10	-	2.20E+00	1.10E+00 C	N/A	N/A	Y	ASL	2.28E-01	Y	2.10E+01 C	N
	191-24-2	Benzo(g,h,i)Perylene	7.60E-03 J	1.20E+00 J	mg/kg	SB-330 (0 - 1 ft)	10 / 10	-	1.20E+00	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+03 NC	N
	207-08-9	Benzo(k)Fluoranthene	5.10E-03 J	7.30E-01 J	mg/kg	SB-330 (0 - 1 ft)	10 / 10	-	7.30E-01	1.10E+01 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+02 C	N
	218-01-9	Chrysene	7.40E-03 J	1.50E+00	mg/kg	SB-330 (0 - 1 ft)	10 / 10	-	1.50E+00	1.10E+02 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+03 C	N
	53-70-3	Dibenzo(a,h)Anthracene	3.20E-03 J	2.10E-01 J	mg/kg	SB-330 (0 - 1 ft)	7 / 10	0.0094 - 0.01	2.10E-01	1.10E-01 C	N/A	N/A	Y	ASL	2.99E-02	Y	2.10E+00 C	N
	206-44-0	Fluoranthene	3.10E-03 J	2.70E+00 J	mg/kg	SB-330 (0 - 1 ft)	10 / 10	-	2.70E+00	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A	3.00E+03 NC	N
	86-73-7	Fluorene	4.90E-03 J	5.90E-02 J	mg/kg	SB-330 (0 - 1 ft)	3 / 10	0.0094 - 0.011	5.90E-02	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A	3.00E+03 NC	N
	193-39-5	Indeno(1,2,3-CD)Pyrene	4.70E-03 J	1.20E+00 J	mg/kg	SB-330 (0 - 1 ft)	10 / 10	-	1.20E+00	1.10E+00 C	N/A	N/A	Y	ASL	1.32E-01	Y	2.10E+01 C	N
	91-20-3	Naphthalene	1.30E-02 J	9.35E-02	mg/kg	SB-330 (0 - 1 ft)	4 / 10	0.0094 - 0.01	9.35E-02	2.00E+00 C	N/A	N/A	N	BSL	N/A	N/A	8.60E+00 C	N
	85-01-8	Phenanthrene	2.10E-03 J	8.50E-01 J	mg/kg	SB-330 (0 - 1 ft)	10 / 10	-	8.50E-01	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+03 NC	N
	129-00-0	Pyrene	3.70E-03 J	3.90E+00 J	mg/kg	SB-330 (0 - 1 ft)	10 / 10	-	3.90E+00	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+03 NC	N
		VOCs																
	99-87-6	4-Isopropyltoluene	3.30E-03 J	3.30E-03 J	mg/kg	SS-3A (0 - 1 ft)	1 / 1	-	3.30E-03	1.90E+02 NC	N/A	N/A	N	BSL	N/A	N/A	9.90E+02 NC	N

TABLE 3-2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Surface Soil (0 - 1 foot)

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)	Industrial RSL (NC/C) (8)	Exceed Industrial RSL? (Y/N)

Notes:

Refer to Attachment A for analytical data tables and summary of samples within each area.

ARAR/TBC = Applicable or Relevant and Appropriate Requirements/To be Considered.

BTV = Background Threshold Value.

C = Cancer. Screening value is based on the screening level protective of carcinogenic effects.

CAS = Chemical Abstracts Service.

COPC = Chemical of Potential Concern.

EN = Essential nutrient.

ft = Feet.

L = Lead screening levels developed by USEPA using blood-lead modeling based on target blood lead concentration of 5 micrograms per deciliter (ug/dL).

mg/kg = Milligrams per kilogram.

N/A = Not Applicable or Not Available.

NC = Noncancer. Screening value is based on the screening level protective of noncarcinogenic effects.

PCBs = Polychlorinated biphenyls.

RSL = Regional Screening Level.

SVOCs = Semivolatile organic compounds.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) Minimum/maximum detected concentration and associated data flags. J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
Total PCB results for the on-Project Blue Beach area are associated with soil samples collected from three sampling units (SUs) using an incremental sampling methodology (ISM). Summary statistics were calculated following resolution of triplicate ISM samples per SU with the SU-specific concentration equal to the 95 percent upper confidence limit (UCL) concentration (95% UCL) (calculated using the ISM calculator). The SU-specific 95% UCL, which is higher than the SU-specific maximum detected concentration, is selected as a conservative concentration for purposes of COPC selection.

(2) Lab Reporting Detection Limits (RDLs) are shown where the frequency of detection is less than 100%.

(3) Maximum detected concentration used for screening.

(4) Screening levels are equal to the USEPA Regional Screening Level (RSL) for residential soil based on a target risk level of 1E-6 for carcinogens and a target hazard quotient of 0.1 for noncarcinogens (May 2020).
The following surrogates were used for chemicals without available screening levels or with multiple forms:
The value for cadmium in the diet was used for cadmium.
The value for trivalent chromium was used for chromium.
The value for manganese non-diet was used for manganese.
The value for mercuric chloride was used for mercury.
The value for Aroclor-1254 was used for total PCBs.
The value for acenaphthene was used for acenaphthylene.
The value for pyrene was used for benzo(g,h,i)perylene and phenanthrene.
The value for isopropylbenzene (cumene) was used for 4-isopropyltoluene.

(5) Preliminary COPCs are selected as chemicals detected at concentrations greater than residential soil RSLs.

(6) Rationale Codes:
Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL); Essential Nutrient (NUT)

(7) Equal to the Background Threshold Value (BTV) calculated for chemicals identified as preliminary COPCs within the associated medium and exposure point (area), as described in the report text.

(8) A comparison to the USEPA industrial soil RSLs (based on a target risk level of 1E-6 and target hazard quotient of 0.1) (May 2020) is also provided for informational purposes. Surrogates for chemicals without available industrial soil RSLs are consistent with those described in footnote (5). Industrial soil RSLs are not utilized for COPC selection..

TABLE 3-2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil (1 - 15 feet) *

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)	Industrial RSL (NC/C) (8)	Exceed Industrial RSL? (Y/N)
On-Project		**Inorganics**																
Blue Beach Area	7429-90-5	Aluminum	2.10E+03	8.87E+03	mg/kg	SB-313 (1 - 3 ft)	27 / 27	-	8.87E+03	7.70E+03 NC	N/A	N/A	Y	ASL	1.48E+04	N	1.10E+05 NC	N
	7440-36-0	Antimony	1.70E-02 J	3.75E+00	mg/kg	SB-BG-1 (1 - 3 ft)	26 / 27	0.038 - 0.038	3.75E+00	3.10E+00 NC	N/A	N/A	Y	ASL	6.85E-02	Y	4.70E+01 NC	N
	7440-38-2	Arsenic	6.10E-01	8.02E+00	mg/kg	SB-322 (1 - 3 ft)	37 / 37	-	8.02E+00	6.80E-01 C	N/A	N/A	Y	ASL	3.81E+00	Y	3.00E+00 C	Y
	7440-39-3	Barium	3.82E+00	7.43E+01	mg/kg	SB-BG-1 (1 - 3 ft)	37 / 37	-	7.43E+01	1.50E+03 NC	N/A	N/A	N	BSL	N/A	N/A	2.20E+04 NC	N
	7440-41-7	Beryllium	2.59E-01	7.91E-01	mg/kg	SB-317 (1 - 3 ft)	27 / 27	-	7.91E-01	1.60E+01 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+02 NC	N
	7440-43-9	Cadmium	2.00E-02 J	9.06E+00	mg/kg	SB-BG-1 (1 - 3 ft)	32 / 37	0.015 - 0.5	9.06E+00	7.10E+00 NC	N/A	N/A	Y	ASL	9.04E-02	Y	9.80E+01 NC	N
	7440-70-2	Calcium	2.15E+02 J	7.98E+02	mg/kg	SB-322 (1 - 3 ft)	27 / 27	-	7.98E+02	EN	N/A	N/A	N	NUT	N/A	N/A	EN	N
	7440-47-3	Chromium	8.00E-01 J	7.75E+01	mg/kg	SB-BG-1 (1 - 3 ft)	37 / 37	-	7.75E+01	1.20E+04 NC	N/A	N/A	N	BSL	N/A	N/A	1.80E+05 NC	N
	7440-48-4	Cobalt	9.92E-01	5.39E+00	mg/kg	SB-BG-1 (1 - 3 ft)	27 / 27	-	5.39E+00	2.30E+00 NC	N/A	N/A	Y	ASL	8.86E+00	N	3.50E+01 NC	N
	7440-50-8	Copper	1.94E+00	8.71E+02	mg/kg	SB-BG-1 (1 - 3 ft)	27 / 27	-	8.71E+02	3.10E+02 NC	N/A	N/A	Y	ASL	1.50E+01	Y	4.70E+03 NC	N
	7439-89-6	Iron	3.96E+03	1.90E+04	mg/kg	SB-BG-1 (1 - 3 ft)	27 / 27	-	1.90E+04	5.50E+03 NC	N/A	N/A	Y	ASL	1.97E+04	N	8.20E+04 NC	N
	7439-92-1	Lead	1.60E+00 J	9.39E+02	mg/kg	SB-314 (1 - 3 ft)	37 / 37	-	9.39E+02	4.00E+02 L	N/A	N/A	Y	ASL	6.27E+01	Y	8.00E+02 L	Y
	7439-95-4	Magnesium	2.86E+02	1.69E+03 J	mg/kg	SB-309 (1 - 3 ft)	27 / 27	-	1.69E+03	EN	N/A	N/A	N	NUT	N/A	N/A	EN	N
	7439-96-5	Manganese	5.00E+01	2.52E+02	mg/kg	SB-315 (1 - 3 ft)	27 / 27	-	2.52E+02	1.80E+02 NC	N/A	N/A	Y	ASL	2.41E+02	Y	2.60E+03 NC	N
	7439-97-6	Mercury	8.20E-03 J	9.36E-01	mg/kg	SB-BG-1 (1 - 3 ft)	17 / 37	0.014 - 0.035	9.36E-01	2.30E+00 NC	N/A	N/A	N	BSL	N/A	N/A	3.50E+01 NC	N
	7440-02-0	Nickel	1.76E+00	2.78E+01	mg/kg	SB-BG-1 (1 - 3 ft)	27 / 27	-	2.78E+01	1.50E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.20E+03 NC	N
	7440-09-7	Potassium	2.34E+02	7.42E+02	mg/kg	SB-304 (1 - 3 ft)	27 / 27	-	7.42E+02	EN	N/A	N/A	N	NUT	N/A	N/A	EN	N
	7782-49-2	Selenium	4.20E-02 J	2.80E-01 J	mg/kg	SB-313 (1 - 3 ft)	26 / 37	0.23 - 5.1	2.80E-01	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A	5.80E+02 NC	N
	7440-22-4	Silver	6.40E-03 J	4.94E+00	mg/kg	SB-322 (1 - 3 ft)	26 / 37	0.03 - 0.5	4.94E+00	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A	5.80E+02 NC	N
	7440-23-5	Sodium	1.60E+01 J	6.54E+01 J	mg/kg	SB-322 (1 - 3 ft)	19 / 27	21 - 33	6.54E+01	EN	N/A	N/A	N	NUT	N/A	N/A	EN	N
	7440-28-0	Thallium	3.00E-02 J	1.10E-01	mg/kg	SB-315 (1 - 3 ft)	27 / 27	-	1.10E-01	7.80E-02 NC	N/A	N/A	Y	ASL	1.82E-01	N	1.20E+00 NC	N
	7440-62-2	Vanadium	2.70E+00	1.28E+01	mg/kg	SB-311 (1 - 3 ft)	27 / 27	-	1.28E+01	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A	5.80E+02 NC	N
	7440-66-6	Zinc	1.32E+01	2.77E+02	mg/kg	SB-BG-1 (1 - 3 ft)	27 / 27	-	2.77E+02	2.30E+03 NC	N/A	N/A	N	BSL	N/A	N/A	3.50E+04 NC	N
		PCBs																
	Tot-PCB-ARO	Total PCB Aroclors	8.90E-02	4.94E-01	mg/kg	ISM-BG1	3 / 3	-	4.94E-01	1.20E-01 NC	N/A	N/A	Y	ASL	N/A	N/A	9.70E-01 C	N
		SVOCs																
	90-12-0	1-Methylnaphthalene	1.70E-03 J	1.80E-02 J	mg/kg	SB-308 (1 - 3 ft)	12 / 26	0.0087 - 0.011	1.80E-02	1.80E+01 C	N/A	N/A	N	BSL	N/A	N/A	7.30E+01 C	N
	91-57-6	2-Methylnaphthalene	2.60E-03 J	1.80E-02 J	mg/kg	SB-319; SB-308; SB-310 (1 - 3 ft)	15 / 28	0.0087 - 0.21	1.80E-02	2.40E+01 NC	N/A	N/A	N	BSL	N/A	N/A	3.00E+02 NC	N
	83-32-9	Acenaphthene	9.00E-03 J	1.10E-02 J	mg/kg	SB-321 (1 - 3 ft)	2 / 27	0.0087 - 0.42	1.10E-02	3.60E+02 NC	N/A	N/A	N	BSL	N/A	N/A	4.50E+03 NC	N
	120-12-7	Anthracene	1.60E-03 J	2.50E-02	mg/kg	SB-321 (1 - 3 ft)	15 / 28	0.0087 - 0.42	2.50E-02	1.80E+03 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+04 NC	N
	56-55-3	Benzo(a)anthracene	1.40E-02 J	1.40E-01	mg/kg	SB-304 (1 - 3 ft)	13 / 28	0.0087 - 0.42	1.40E-01	1.10E+00 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+01 C	N
	50-32-8	Benzo(a)Pyrene	3.90E-03 J	1.30E-01	mg/kg	SB-304 (1 - 3 ft)	16 / 28	0.0087 - 0.42	1.30E-01	1.10E-01 C	N/A	N/A	Y	ASL	5.15E-01	N	2.10E+00 C	N
	205-99-2	Benzo(b)fluoranthene	2.60E-03 J	2.60E-01 J	mg/kg	SB-303 (1 - 3 ft)	18 / 28	0.0087 - 0.42	2.60E-01	1.10E+00 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+01 C	N
	191-24-2	Benzo(g,h,i)Perylene	3.30E-03 J	1.00E-01	mg/kg	SB-304 (1 - 3 ft)	14 / 27	0.0087 - 0.42	1.00E-01	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+03 NC	N
	207-08-9	Benzo(k)Fluoranthene	5.80E-03 J	9.30E-02	mg/kg	SB-304 (1 - 3 ft)	18 / 28	0.0087 - 0.42	9.30E-02	1.10E+01 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+02 C	N
	117-81-7	Bis-(2-Ethylhexyl)-Phthalate	3.60E-01	4.30E-01	mg/kg	SB-319 (1 - 3 ft)	2 / 27	0.22 - 0.28	4.30E-01	3.90E+01 C	N/A	N/A	N	BSL	N/A	N/A	1.60E+02 C	N
	218-01-9	Chrysene	1.90E-03 J	2.00E-01	mg/kg	SB-304 (1 - 3 ft)	17 / 28	0.0087 - 0.42	2.00E-01	1.10E+02 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+03 C	N
	53-70-3	Dibenzo(a,h)Anthracene	2.20E-03 J	3.30E-02	mg/kg	SB-304 (1 - 3 ft)	13 / 28	0.0087 - 0.21	3.30E-02	1.10E-01 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+00 C	N
	206-44-0	Fluoranthene	2.20E-03 J	2.00E-01	mg/kg	SB-319 (1 - 3 ft) SB-321 (1 - 3 ft)	16 / 28	0.0087 - 0.42	2.00E-01	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A	3.00E+03 NC	N
	86-73-7	Fluorene	3.90E-03 J	9.70E-03 J	mg/kg	SB-321 (1 - 3 ft)	8 / 28	0.0087 - 0.42	9.70E-03	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A	3.00E+03 NC	N

TABLE 3-2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil (1 - 15 feet) *

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)	Industrial RSL (NC/C) (8)	Exceed Industrial RSL? (Y/N)
On-Project	193-39-5	Indeno(1,2,3-CD)Pyrene	5.10E-03 J	1.10E-01	mg/kg	SB-304 (1 - 3 ft)	12 / 27	0.0087 - 0.42	1.10E-01	1.10E+00 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+01 C	N
Blue Beach Area	91-20-3	Naphthalene	4.90E-03 J	1.50E-02 J	mg/kg	SB-319 (1 - 3 ft)	6 / 27	0.0087 - 0.42	1.50E-02	2.00E+00 C	N/A	N/A	N	BSL	N/A	N/A	8.60E+00 C	N
	85-01-8	Phenanthrene	2.10E-03 J	1.30E-01	mg/kg	SB-321 (1 - 3 ft)	18 / 28	0.0087 - 0.42	1.30E-01	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+03 NC	N
	129-00-0	Pyrene	2.40E-03 J	2.00E-01	mg/kg	SB-319 (1 - 3 ft)	20 / 28	0.0087 - 0.42	2.00E-01	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+03 NC	N
		VOCs																
	71-55-6	1,1,1-Trichloroethane	5.30E-03 J	5.30E-03 J	mg/kg	SB-308 (1 - 3 ft)	1 / 37	0.001 - 0.21	5.30E-03	8.10E+02 NC	N/A	N/A	N	BSL	N/A	N/A	3.60E+03 NC	N
	75-34-3	1,1-Dichloroethane	4.85E-02	4.85E-02	mg/kg	GP-TR2 6-8 (6 - 8 ft)	1 / 37	0.001 - 0.21	4.85E-02	3.60E+00 C	N/A	N/A	N	BSL	N/A	N/A	1.60E+01 C	N
	95-63-6	1,2,4-Trimethylbenzene	1.50E-03 J	6.33E+01	mg/kg	GP-TR1 5-7 (5 - 7 ft)	7 / 37	0.001 - 0.21	6.33E+01	3.00E+01 NC	N/A	N/A	Y	ASL	N/A	N/A	1.80E+02 NC	N
	108-67-8	1,3,5-Trimethylbenzene	9.00E-04 J	1.47E+01	mg/kg	GP-TR1 5-7 (5 - 7 ft)	5 / 37	0.001 - 0.21	1.47E+01	2.70E+01 NC	N/A	N/A	N	BSL	N/A	N/A	1.50E+02 NC	N
	106-46-7	1,4-Dichlorobenzene	4.10E-04 J	4.10E-04 J	mg/kg	SB-311 (1 - 3 ft)	1 / 37	0.001 - 0.21	4.10E-04	2.60E+00 C	N/A	N/A	N	BSL	N/A	N/A	1.10E+01 C	N
	78-93-3	2-Butanone (MEK)	7.20E-03 J	2.79E+00	mg/kg	GP-TR2 6-8 (6 - 8 ft)	4 / 37	0.006 - 4.2	2.79E+00	2.70E+03 NC	N/A	N/A	N	BSL	N/A	N/A	1.90E+04 NC	N
	99-87-6	4-Isopropyltoluene	1.45E-01	7.50E-01	mg/kg	GP-TR1 5-7 (5 - 7 ft)	3 / 37	0.001 - 0.21	7.50E-01	1.90E+02 NC	N/A	N/A	N	BSL	N/A	N/A	9.90E+02 NC	N
	108-10-1	4-Methyl-2-pentanone	2.10E-01 J	3.58E+02	mg/kg	GP-TR2 6-8 (6 - 8 ft)	2 / 37	0.006 - 2.1	3.58E+02	3.30E+03 NC	N/A	N/A	N	BSL	N/A	N/A	1.40E+04 NC	N
	67-64-1	Acetone	3.00E-03 J	2.28E+00	mg/kg	GP-TR2 6-8 (6 - 8 ft)	11 / 37	0.006 - 11	2.28E+00	6.10E+03 NC	N/A	N/A	N	BSL	N/A	N/A	6.70E+04 NC	N
	71-43-2	Benzene	4.75E-01	4.75E-01	mg/kg	GP-TR2 6-8 (6 - 8 ft)	1 / 38	0.001 - 0.22	4.75E-01	1.20E+00 C	N/A	N/A	N	BSL	N/A	N/A	5.10E+00 C	N
	75-15-0	Carbon Disulfide	8.20E-04 J	4.80E-03 J	mg/kg	SB-107 (7 - 9 ft)	4 / 37	0.0012 - 0.63	4.80E-03	7.70E+01 NC	N/A	N/A	N	BSL	N/A	N/A	3.50E+02 NC	N
	156-59-2	cis-1,2-Dichloroethene	1.70E-03 J	1.53E-01	mg/kg	GP-TR2 6-8 (6 - 8 ft)	4 / 37	0.001 - 0.21	1.53E-01	1.60E+01 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+02 NC	N
	100-41-4	Ethylbenzene	2.10E-03 J	7.79E+01	mg/kg	GP-TR2 6-8 (6 - 8 ft)	6 / 38	0.001 - 0.22	7.79E+01	5.80E+00 C	N/A	N/A	Y	ASL	N/A	N/A	2.50E+01 C	Y
	98-82-8	Isopropylbenzene	1.95E-01	1.07E+00	mg/kg	GP-TR1 5-7 (5 - 7 ft)	3 / 37	0.001 - 0.21	1.07E+00	1.90E+02 NC	N/A	N/A	N	BSL	N/A	N/A	9.90E+02 NC	N
	75-09-2	Methylene Chloride	1.06E+00	1.06E+00	mg/kg	GP-TR2 6-8 (6 - 8 ft)	1 / 37	0.006 - 2.1	1.06E+00	3.50E+01 NC	N/A	N/A	N	BSL	N/A	N/A	3.20E+02 NC	N
	91-20-3	Naphthalene	3.57E-02 J	7.49E-02	mg/kg	GP-TR2 6-8 (6 - 8 ft)	2 / 18	0.007 - 50.9	7.49E-02	2.00E+00 C	N/A	N/A	N	BSL	N/A	N/A	8.60E+00 C	N
	103-65-1	n-Propylbenzene	8.00E-04 J	9.05E+00	mg/kg	GP-TR1 5-7 (5 - 7 ft)	5 / 37	0.001 - 0.21	9.05E+00	3.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.40E+03 NC	N
	135-98-8	sec-Butylbenzene	3.78E-01	1.96E+00	mg/kg	GP-TR1 5-7 (5 - 7 ft)	3 / 37	0.001 - 0.21	1.96E+00	7.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	1.20E+04 NC	N
	127-18-4	Tetrachloroethene	1.40E-03 J	1.65E-01	mg/kg	GP-TR1 5-7 (5 - 7 ft)	6 / 37	0.001 - 0.21	1.65E-01	8.10E+00 NC	N/A	N/A	N	BSL	N/A	N/A	3.90E+01 NC	N
	108-88-3	Toluene	1.20E-03 J	4.33E+02	mg/kg	GP-TR2 6-8 (6 - 8 ft)	14 / 38	0.001 - 0.22	4.33E+02	4.90E+02 NC	N/A	N/A	N	BSL	N/A	N/A	4.70E+03 NC	N
	Tot-Xylenes	Total Xylenes	6.50E-03	4.90E+02	mg/kg	GP-TR2 6-8 (6 - 8 ft)	7 / 38	0.0036 - 0.66	4.90E+02	5.80E+01 NC	N/A	N/A	Y	ASL	N/A	N/A	2.50E+02 NC	Y
	79-01-6	Trichloroethylene	1.80E-03 J	2.58E+00	mg/kg	GP-TR2 6-8 (6 - 8 ft)	9 / 37	0.001 - 0.21	2.58E+00	4.10E-01 NC	N/A	N/A	Y	ASL	N/A	N/A	1.90E+00 NC	Y

TABLE 3-2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil (1 - 15 feet) *

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)	Industrial RSL (NC/C) (8)	Exceed Industrial RSL? (Y/N)
Off-Project		**Inorganics**																
Red Maple	7440-38-2	Arsenic	2.90E+00	7.60E+00	mg/kg	SS-6A (1 - 2 ft)	6 / 6	-	7.60E+00	6.80E-01 C	N/A	N/A	Y	ASL	3.81E+00	Y	3.00E+00 C	Y
Swamp / Tidal	7440-39-3	Barium	5.20E+00	1.60E+01	mg/kg	SS-5A (1 - 2 ft)	6 / 6	-	1.60E+01	1.50E+03 NC	N/A	N/A	N	BSL	N/A	N/A	2.20E+04 NC	N
Stream Area	7440-43-9	Cadmium	9.00E-02 J	1.00E-01 J	mg/kg	SS-5A (1 - 2 ft)	2 / 6	0.5 - 0.6	1.00E-01	7.10E+00 NC	N/A	N/A	N	BSL	N/A	N/A	9.80E+01 NC	N
	7440-47-3	Chromium	2.40E+00	7.00E+00	mg/kg	SS-6A (1 - 2 ft)	6 / 6	-	7.00E+00	1.20E+04 NC	N/A	N/A	N	BSL	N/A	N/A	1.80E+05 NC	N
	7439-92-1	Lead	4.10E+00 J	3.41E+01	mg/kg	SS-5A (1 - 2 ft)	6 / 6	-	3.41E+01	4.00E+02 L	N/A	N/A	N	BSL	N/A	N/A	8.00E+02 L	N
	7439-97-6	Mercury	1.40E-02 J	3.43E-02 J	mg/kg	SS-1A (1 - 2 ft)	3 / 6	0.032 - 0.037	3.43E-02	2.30E+00 NC	N/A	N/A	N	BSL	N/A	N/A	3.50E+01 NC	N
		SVOCs																
	91-57-6	2-Methylnaphthalene	2.30E-01	8.82E+00	mg/kg	SB-210 (8 - 10 ft)	12 / 15	0.16 - 0.7	8.82E+00	2.40E+01 NC	N/A	N/A	N	BSL	N/A	N/A	3.00E+02 NC	N
	83-32-9	Acenaphthene	9.00E-02 J	1.50E-01 J	mg/kg	SB-214 (6 - 8 ft)	5 / 16	0.16 - 0.7	1.50E-01	3.60E+02 NC	N/A	N/A	N	BSL	N/A	N/A	4.50E+03 NC	N
	120-12-7	Anthracene	1.70E-01 J	1.70E-01 J	mg/kg	SB-206 (8 - 10 ft)	1 / 16	0.16 - 0.7	1.70E-01	1.80E+03 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+04 NC	N
	56-55-3	Benzo(a)anthracene	6.60E-01	6.60E-01	mg/kg	SB-206 (8 - 10 ft)	1 / 16	0.16 - 0.7	6.60E-01	1.10E+00 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+01 C	N
	50-32-8	Benzo(a)Pyrene	6.40E-01	8.60E-01 J	mg/kg	SB-207 (8 - 10 ft)	2 / 16	0.16 - 0.19	8.60E-01	1.10E-01 C	N/A	N/A	Y	ASL	5.15E-01	Y	2.10E+00 C	N
	205-99-2	Benzo(b)fluoranthene	8.10E-01	8.10E-01	mg/kg	SB-206 (8 - 10 ft)	1 / 16	0.16 - 0.7	8.10E-01	1.10E+00 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+01 C	N
	191-24-2	Benzo(g,h,i)Perylene	2.30E-01 J	2.30E-01 J	mg/kg	SB-206 (8 - 10 ft)	1 / 16	0.16 - 0.7	2.30E-01	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+03 NC	N
	207-08-9	Benzo(k)Fluoranthene	2.70E-01 J	2.70E-01 J	mg/kg	SB-206 (8 - 10 ft)	1 / 16	0.16 - 0.7	2.70E-01	1.10E+01 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+02 C	N
	218-01-9	Chrysene	6.50E-01	6.50E-01	mg/kg	SB-206 (8 - 10 ft)	1 / 16	0.16 - 0.7	6.50E-01	1.10E+02 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+03 C	N
	206-44-0	Fluoranthene	1.00E-01 J	1.16E+00	mg/kg	SB-206 (8 - 10 ft)	2 / 16	0.16 - 0.7	1.16E+00	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A	3.00E+03 NC	N
	86-73-7	Fluorene	9.00E-02 J	1.20E-01 J	mg/kg	SB-213; SB-214 (6 - 8 ft)	5 / 16	0.16 - 0.7	1.20E-01	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A	3.00E+03 NC	N
	193-39-5	Indeno(1,2,3-CD)Pyrene	2.80E-01 J	2.80E-01 J	mg/kg	SB-206 (8 - 10 ft)	1 / 16	0.16 - 0.7	2.80E-01	1.10E+00 C	N/A	N/A	N	BSL	N/A	N/A	2.10E+01 C	N
	91-20-3	Naphthalene	1.30E-01 J	1.48E+01	mg/kg	SB-207 (8 - 10 ft)	13 / 16	0.16 - 0.18	1.48E+01	2.00E+00 C	N/A	N/A	Y	ASL	1.33E-02	Y	8.60E+00 C	Y
	85-01-8	Phenanthrene	9.00E-02 J	5.30E-01 J	mg/kg	SB-206 (8 - 10 ft)	4 / 16	0.16 - 0.7	5.30E-01	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+03 NC	N
	129-00-0	Pyrene	9.00E-02 J	1.04E+00	mg/kg	SB-206 (8 - 10 ft)	3 / 16	0.16 - 0.7	1.04E+00	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+03 NC	N
		VOCs																
	71-43-2	Benzene	1.00E-02 J	4.10E-01 J	mg/kg	SB-206 (8 - 10 ft)	4 / 18	0.0033 - 0.47	4.10E-01	1.20E+00 C	N/A	N/A	N	BSL	N/A	N/A	5.10E+00 C	N
	156-59-2	cis-1,2-Dichloroethene	1.00E-02	1.00E-02	mg/kg	SB-106 (3 - 5 ft)	1 / 2	0.0048 - 0.0048	1.00E-02	1.60E+01 NC	N/A	N/A	N	BSL	N/A	N/A	2.30E+02 NC	N
	100-41-4	Ethylbenzene	8.00E-02 J	9.70E+00	mg/kg	SB-209 (8 - 10 ft)	16 / 18	0.0033 - 0.0048	9.70E+00	5.80E+00 C	N/A	N/A	Y	ASL	N/A	N/A	2.50E+01 C	N
	91-20-3	Naphthalene	1.40E-01 J	1.98E+01 J	mg/kg	SB-207 (8 - 10 ft)	16 / 18	3.3 - 4.8	1.98E+01	2.00E+00 C	N/A	N/A	Y	ASL	1.33E-02	Y	8.60E+00 C	Y
	108-88-3	Toluene	2.00E-02 J	4.40E-01 J	mg/kg	SB-201 (8 - 10 ft)	9 / 18	0.0033 - 0.47	4.40E-01	4.90E+02 NC	N/A	N/A	N	BSL	N/A	N/A	4.70E+03 NC	N
	Tot-Xylenes	Total Xylenes	1.90E-01	1.30E+01	mg/kg	SB-206 (8 - 10 ft)	16 / 18	0.0099 - 0.014	1.30E+01	5.80E+01 NC	N/A	N/A	N	BSL	N/A	N/A	2.50E+02 NC	N
	79-01-6	Trichloroethylene	2.84E-02	2.84E-02	mg/kg	SB-106 (3 - 5 ft)	1 / 2	0.0048 - 0.0048	2.84E-02	4.10E-01 NC	N/A	N/A	N	BSL	N/A	N/A	1.90E+00 NC	N

Notes:

Refer to Attachment A for analytical data tables and summary of samples within each area. *This soil depth interval includes one soil sample collected from a depth of 14.25 to 15.5 feet below ground surface.

ARAR/TBC = Applicable or Relevant and Appropriate Requirements/To be Considered.

BTV = Background Threshold Value.

C = Cancer. Screening value is based on the screening level protective of carcinogenic effects.

CAS = Chemical Abstracts Service.

COPC = Chemical of Potential Concern.

EN = Essential nutrient.

ft = Feet.

L = Lead screening levels developed by USEPA using blood-lead modeling based on target blood lead concentration of 5 micrograms per deciliter (ug/dL).

mg/kg = Milligrams per kilogram.

TABLE 3-2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil (1 - 15 feet) *

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)	Industrial RSL (NC/C) (8)	Exceed Industrial RSL? (Y/N)

N/A = Not Applicable or Not Available.

NC = Noncancer. Screening value is based on the screening level protective of noncarcinogenic effects.

PCBs = Polychlorinated biphenyls.

RSL = Regional Screening Level.

SVOCs = Semivolatile organic compounds.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) Minimum/maximum detected concentration and associated data flags. J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
Total PCB results for the on-Project Blue Beach area are associated with soil samples collected from three sampling units (SUs) using an incremental sampling methodology (ISM). Summary statistics were calculated following resolution of triplicate ISM samples per SU with the SU-specific concentration equal to the 95 percent upper confidence limit (UCL) concentration (95% UCL) (calculated using the ISM calculator). The SU-specific 95% UCL, which is higher than the SU-specific maximum detected concentration, is selected as a conservative concentration for purposes of COPC selection.

(2) Lab Reporting Detection Limits (RDLs) are shown where the frequency of detection is less than 100%.

(3) Maximum detected concentration used for screening.

(4) Screening levels are equal to the USEPA Regional Screening Level (RSL) for residential soil based on a target risk level of 1E-6 for carcinogens and a target hazard quotient of 0.1 for noncarcinogens (May 2020).
The following surrogates were used for chemicals without available screening levels or with multiple forms:
The value for cadmium in the diet was used for cadmium.
The value for trivalent chromium was used for chromium.
The value for manganese non-diet was used for manganese.
The value for mercuric chloride was used for mercury.
The value for Aroclor-1254 was used for total PCBs.
The value for pyrene was used for benzo(g,h,i)perylene and phenanthrene.
The value for isopropylbenzene (cumene) was used for 4-isopropyltoluene.

(5) Preliminary COPCs are selected as chemicals detected at concentrations greater than residential soil RSLs.

(6) Rationale Codes:
Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL); Essential Nutrient (NUT)

(7) Equal to the Background Threshold Value (BTV) calculated for chemicals identified as preliminary COPCs within the associated medium and exposure point (area), as described in the report text.

(8) A comparison to the USEPA industrial soil RSLs (based on a target risk level of 1E-6 and target hazard quotient of 0.1) (May 2020) is also provided for informational purposes. Surrogates for chemicals without available industrial soil RSLs are consistent with those described in footnote (5). Industrial soil RSLs are not utilized for COPC selection..

TABLE 3-2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SURFACE HYDRIC SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Hydric Soil
Exposure Medium: Surface Hydric Soil (0 - 1 feet)

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)
Off-Project		**Inorganics**														
Red Maple	7429-90-5	Aluminum	4.80E+03	2.20E+04	mg/kg	SSH-301 (0 - 1 ft)	10 / 10	-	2.20E+04	7.70E+03 NC	N/A	N/A	Y	ASL	1.10E+04	Y
Swamp / Tidal	7440-36-0	Antimony	9.90E-02 J	1.16E+00	mg/kg	SSH-303 (0 - 1 ft)	10 / 10	-	1.16E+00	3.10E+00 NC	N/A	N/A	N	BSL	N/A	N/A
Stream Area	7440-38-2	Arsenic	2.37E+00	1.63E+01	mg/kg	SSH-309 (0 - 1 ft)	16 / 16	-	1.63E+01	6.80E-01 C	N/A	N/A	Y	ASL	3.27E+00	Y
	7440-39-3	Barium	5.20E+00	2.14E+01	mg/kg	SSH-301 (0 - 1 ft)	16 / 16	-	2.14E+01	1.50E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-41-7	Beryllium	4.34E-01	1.19E+00	mg/kg	SSH-301 (0 - 1 ft)	8 / 10	0.091 - 0.11	1.19E+00	1.60E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-43-9	Cadmium	5.80E-02 J	2.38E+00	mg/kg	SSH-304 (0 - 1 ft)	14 / 16	1.4 - 1.6	2.38E+00	7.10E+00 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-70-2	Calcium	1.41E+03	5.23E+03	mg/kg	SSH-302 (0 - 1 ft)	10 / 10	-	5.23E+03	EN	N/A	N/A	N	NUT	N/A	N/A
	7440-47-3	Chromium	8.25E+00	3.34E+01	mg/kg	SSH-308 (0 - 1 ft)	16 / 16	-	3.34E+01	1.20E+04 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-48-4	Cobalt	1.54E+00	8.51E+00	mg/kg	SSH-304 (0 - 1 ft)	10 / 10	-	8.51E+00	2.30E+00 NC	N/A	N/A	Y	ASL	3.24E+00	Y
	7440-50-8	Copper	6.78E+00	4.40E+01	mg/kg	SSH-304 (0 - 1 ft)	10 / 10	-	4.40E+01	3.10E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	7439-89-6	Iron	5.05E+03	2.26E+04	mg/kg	SSH-301 (0 - 1 ft)	10 / 10	-	2.26E+04	5.50E+03 NC	N/A	N/A	Y	ASL	1.31E+04	Y
	7439-92-1	Lead	1.28E+01	2.77E+02	mg/kg	SSH-304 (0 - 1 ft)	16 / 16	-	2.77E+02	4.00E+02 L	N/A	N/A	N	BSL	N/A	N/A
	7439-95-4	Magnesium	2.15E+03	8.09E+03	mg/kg	SSH-303 (0 - 1 ft)	10 / 10	-	8.09E+03	EN	N/A	N/A	N	NUT	N/A	N/A
	7439-96-5	Manganese	6.49E+01	2.05E+02	mg/kg	SSH-301 (0 - 1 ft)	10 / 10	-	2.05E+02	1.80E+02 NC	N/A	N/A	Y	ASL	1.05E+02	Y
	7439-97-6	Mercury	4.40E-02 J	2.10E-01 J	mg/kg	SSH-302 (0 - 1 ft)	14 / 16	0.042 - 0.083	2.10E-01	2.30E+00 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-02-0	Nickel	5.18E+00	3.04E+01	mg/kg	SSH-304 (0 - 1 ft)	10 / 10	-	3.04E+01	1.50E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-09-7	Potassium	1.04E+03	2.52E+03	mg/kg	SSH-305 (0 - 1 ft)	10 / 10	-	2.52E+03	EN	N/A	N/A	N	NUT	N/A	N/A
	7782-49-2	Selenium	1.90E-01 J	4.90E+00 J	mg/kg	SSH-6 (0 - 1 ft)	15 / 16	7.1 - 7.1	4.90E+00	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-22-4	Silver	3.80E-02 J	4.81E-01 J	mg/kg	SSH-303 (0 - 1 ft)	10 / 16	0.7 - 2.4	4.81E-01	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-23-5	Sodium	6.60E+03	4.80E+04	mg/kg	SSH-303 (0 - 1 ft)	10 / 10	-	4.80E+04	EN	N/A	N/A	N	NUT	N/A	N/A
	7440-28-0	Thallium	7.70E-02 J	2.66E-01	mg/kg	SSH-304 (0 - 1 ft)	7 / 10	0.054 - 0.12	2.66E-01	7.80E-02 NC	N/A	N/A	Y	ASL	N/A	N/A
	7440-62-2	Vanadium	1.38E+01	5.33E+01	mg/kg	SSH-303 (0 - 1 ft)	10 / 10	-	5.33E+01	3.90E+01 NC	N/A	N/A	Y	ASL	2.45E+01	Y
	7440-66-6	Zinc	2.45E+01	2.56E+02	mg/kg	SSH-304 (0 - 1 ft)	10 / 10	-	2.56E+02	2.30E+03 NC	N/A	N/A	N	BSL	N/A	N/A
		PCBs														
	Tot-PCB-ARO	Total PCB Aroclors	1.30E-01	2.30E+00	mg/kg	SSH-4 (0 - 1 ft)	10 / 16	0.14 - 2.1	2.30E+00	1.20E-01 NC	N/A	N/A	Y	ASL	N/A	N/A

TABLE 3-2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SURFACE HYDRIC SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Hydric Soil
Exposure Medium: Surface Hydric Soil (0 - 1 feet)

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)
Off-Project		**SVOCs**														
Red Maple	90-12-0	1-Methylnaphthalene	6.40E-03 J	3.40E-01 J	mg/kg	SSH-301 (0 - 1 ft)	7 / 10	0.028 - 0.071	3.40E-01	1.80E+01 C	N/A	N/A	N	BSL	N/A	N/A
Swamp / Tidal	120-83-2	2,4-Dichlorophenol	5.60E-01	1.80E+00	mg/kg	SSH-303 (0 - 1 ft)	8 / 10	0.44 - 1	1.80E+00	1.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A
Stream Area	91-57-6	2-Methylnaphthalene	6.80E-03 J	3.30E-01 J	mg/kg	SSH-301 (0 - 1 ft)	8 / 10	0.028 - 0.041	3.30E-01	2.40E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	83-32-9	Acenaphthene	1.30E-02 J	4.70E-02 J	mg/kg	SSH-301 (0 - 1 ft)	4 / 10	0.022 - 0.071	4.70E-02	3.60E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	208-96-8	Acenaphthylene	1.30E-02 J	5.35E-02 J	mg/kg	SSH-301 (0 - 1 ft)	4 / 10	0.018 - 0.071	5.35E-02	3.60E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	120-12-7	Anthracene	4.30E-03 J	3.90E-01	mg/kg	SSH-304 (0 - 1 ft)	6 / 10	0.022 - 0.071	3.90E-01	1.80E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	56-55-3	Benzo(a)anthracene	6.70E-02	3.60E+00	mg/kg	SSH-304 (0 - 1 ft)	8 / 10	0.028 - 0.041	3.60E+00	1.10E+00 C	N/A	N/A	Y	ASL	5.90E-01	Y
	50-32-8	Benzo(a)Pyrene	3.20E-02 J	3.00E+00	mg/kg	SSH-304 (0 - 1 ft)	10 / 10	-	3.00E+00	1.10E-01 C	N/A	N/A	Y	ASL	7.00E-01	Y
	205-99-2	Benzo(b)fluoranthene	6.50E-02 J	4.30E+00	mg/kg	SSH-304 (0 - 1 ft)	10 / 10	-	4.30E+00	1.10E+00 C	N/A	N/A	Y	ASL	1.94E+00	Y
	191-24-2	Benzo(g,h,i)Perylene	1.50E-02 J	1.60E+00	mg/kg	SSH-304 (0 - 1 ft)	9 / 10	0.041 - 0.041	1.60E+00	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	207-08-9	Benzo(k)Fluoranthene	2.30E-02 J	1.80E+00	mg/kg	SSH-304 (0 - 1 ft)	10 / 10	-	1.80E+00	1.10E+01 C	N/A	N/A	N	BSL	N/A	N/A
	218-01-9	Chrysene	1.00E-01	3.90E+00	mg/kg	SSH-304 (0 - 1 ft)	8 / 10	0.028 - 0.041	3.90E+00	1.10E+02 C	N/A	N/A	N	BSL	N/A	N/A
	53-70-3	Dibenzo(a,h)Anthracene	1.70E-02 J	4.90E-01	mg/kg	SSH-304 (0 - 1 ft)	8 / 10	0.028 - 0.041	4.90E-01	1.10E-01 C	N/A	N/A	Y	ASL	1.20E-01	Y
	206-44-0	Fluoranthene	6.70E-02	8.20E+00	mg/kg	SSH-304 (0 - 1 ft)	9 / 10	0.041 - 0.041	8.20E+00	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	86-73-7	Fluorene	1.60E-02 J	2.20E-01 J	mg/kg	SSH-301 (0 - 1 ft)	7 / 10	0.028 - 0.041	2.20E-01	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	193-39-5	Indeno(1,2,3-CD)Pyrene	3.70E-02 J	3.30E+00	mg/kg	SSH-304 (0 - 1 ft)	9 / 10	0.041 - 0.041	3.30E+00	1.10E+00 C	N/A	N/A	Y	ASL	1.10E+00	Y
	91-20-3	Naphthalene	1.10E-02 J	5.10E-01 J	mg/kg	SSH-301 (0 - 1 ft)	7 / 10	0.028 - 0.041	5.10E-01	2.00E+00 C	N/A	N/A	N	BSL	N/A	N/A
	85-01-8	Phenanthrene	3.00E-02 J	2.90E+00 J	mg/kg	SSH-301 (0 - 1 ft)	10 / 10	-	2.90E+00	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	129-00-0	Pyrene	3.80E-02 J	6.80E+00	mg/kg	SSH-304 (0 - 1 ft)	10 / 10	-	6.80E+00	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A
		VOCs														
	78-93-3	2-Butanone (MEK)	1.05E-02 J	9.25E-02 J	mg/kg	SSH-6 (0 - 1 ft)	4 / 6	0.136 - 0.242	9.25E-02	2.70E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	67-64-1	Acetone	1.19E-01 J	4.29E+00	mg/kg	SSH-6 (0 - 1 ft)	5 / 6	0.117 - 0.117	4.29E+00	6.10E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	75-15-0	Carbon Disulfide	8.60E-03 J	1.86E-02 J	mg/kg	SSH-3 (0 - 1 ft)	2 / 6	0.0117 - 0.0694	1.86E-02	7.70E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	108-88-3	Toluene	7.19E-02	7.19E-02	mg/kg	SSH-6 (0 - 1 ft)	1 / 6	0.0117 - 0.0242	7.19E-02	4.90E+02 NC	N/A	N/A	N	BSL	N/A	N/A

TABLE 3-2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SURFACE HYDRIC SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Hydric Soil
Exposure Medium:	Surface Hydric Soil (0 - 1 feet)

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)

Notes:

Refer to Attachment A for analytical data tables and summary of samples.

ARAR/TBC = Applicable or Relevant and Appropriate Requirements/To be Considered.

BTV = Background Threshold Value.

C = Cancer. Screening value is based on the screening level protective of carcinogenic effects.

CAS = Chemical Abstracts Service.

COPC = Chemical of Potential Concern.

EN = Essential nutrient.

ft = Feet.

L = Lead screening levels developed by USEPA using blood-lead modeling based on target blood lead concentration of 5 micrograms per deciliter (ug/dL).

mg/kg = Milligrams per kilogram.

N/A = Not Applicable or Not Available.

NC = Noncancer. Screening value is based on the screening level protective of noncarcinogenic effects.

PCBs = Polychlorinated biphenyls.

SVOCs = Semivolatile organic compounds.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) Minimum/maximum detected concentration and associated data flags. J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.

(2) Lab Reporting Detection Limits (RDLs) are shown where the frequency of detection is less than 100%.

(3) Maximum detected concentration used for screening.

(4) Screening levels are equal to the USEPA Regional Screening Level (RSL) for residential soil based on a target risk level of 1E-6 for carcinogens and a target hazard quotient of 0.1 for noncarcinogens (May 2020).

The following surrogates were used for chemicals without available screening levels or with multiple forms:

The value for cadmium in the diet was used for cadmium.

The value for trivalent chromium was used for chromium.

The value for manganese non-diet was used for manganese.

The value for mercuric chloride was used for mercury.

The value for Aroclor-1254 was used for total PCBs.

The value for acenaphthene was used for acenaphthylene.

The value for pyrene was used for benzo(g,h,i)perylene and phenanthrene.

(5) Preliminary COPCs are selected as chemicals detected at concentrations greater than residential soil RSLs.

(6) Rationale Codes:

Selection Reason: Above Screening Level (ASL)

Deletion Reason: Below Screening Level (BSL); Essential Nutrient (NUT)

(7) Equal to the Background Threshold Value (BTV) calculated for chemicals identified as preliminary COPCs within the associated medium and exposure point (area), as described in the report text.

TABLE 3-2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE HYDRIC SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Medium: Hydric Soil
Exposure Medium: Subsurface Hydric Soil (1 - 2 feet)

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)
Off-Project		**Inorganics**														
Red Maple	7429-90-5	Aluminum	1.69E+03	1.25E+04	mg/kg	SSH-301 (1 - 2 ft)	10 / 10	-	1.25E+04	7.70E+03 NC	N/A	N/A	Y	ASL	1.36E+04	N
Swamp / Tidal	7440-36-0	Antimony	2.00E-02 J	5.40E-01	mg/kg	SSH-302 (1 - 2 ft)	10 / 10	-	5.40E-01	3.10E+00 NC	N/A	N/A	N	BSL	N/A	N/A
Stream Area	7440-38-2	Arsenic	6.40E-01	1.33E+01	mg/kg	SSH-307 (1 - 2 ft)	16 / 16	-	1.33E+01	6.80E-01 C	N/A	N/A	Y	ASL	5.67E+00	Y
	7440-39-3	Barium	3.39E+00	1.95E+01 J	mg/kg	SSH-308 (1 - 2 ft)	16 / 16	-	1.95E+01	1.50E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-41-7	Beryllium	7.64E-02	1.14E+00	mg/kg	SSH-308 (1 - 2 ft)	10 / 10	-	1.14E+00	1.60E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-43-9	Cadmium	1.70E-02 J	1.00E+00 J	mg/kg	SSH-4 (1 - 2 ft)	12 / 16	1.3 - 2.2	1.00E+00	7.10E+00 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-70-2	Calcium	5.62E+02	6.65E+03	mg/kg	SSH-301 (1 - 2 ft)	10 / 10	-	6.65E+03	EN	N/A	N/A	N	NUT	N/A	N/A
	7440-47-3	Chromium	2.36E+00	2.90E+01	mg/kg	SSH-6 (1 - 2 ft)	16 / 16	-	2.90E+01	1.20E+04 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-48-4	Cobalt	2.96E-01	4.79E+00	mg/kg	SSH-307 (1 - 2 ft)	10 / 10	-	4.79E+00	2.30E+00 NC	N/A	N/A	Y	ASL	3.26E+00	Y
	7440-50-8	Copper	4.50E-01	2.38E+01	mg/kg	SSH-307 (1 - 2 ft)	10 / 10	-	2.38E+01	3.10E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	7439-89-6	Iron	2.59E+03	1.87E+04	mg/kg	SSH-307 (1 - 2 ft)	10 / 10	-	1.87E+04	5.50E+03 NC	N/A	N/A	Y	ASL	1.34E+04	Y
	7439-92-1	Lead	1.77E+00	1.09E+02	mg/kg	SSH-6 (1 - 2 ft)	16 / 16	-	1.09E+02	4.00E+02 L	N/A	N/A	N	BSL	N/A	N/A
	7439-95-4	Magnesium	7.78E+02	9.48E+03	mg/kg	SSH-301 (1 - 2 ft)	10 / 10	-	9.48E+03	EN	N/A	N/A	N	NUT	N/A	N/A
	7439-96-5	Manganese	1.63E+01	1.42E+02	mg/kg	SSH-301 (1 - 2 ft)	10 / 10	-	1.42E+02	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	7439-97-6	Mercury	4.30E-02 J	2.68E-01	mg/kg	SSH-304 (1 - 2 ft)	8 / 16	0.02 - 0.173	2.68E-01	2.30E+00 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-02-0	Nickel	5.84E-01	1.69E+01	mg/kg	SSH-307 (1 - 2 ft)	10 / 10	-	1.69E+01	1.50E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-09-7	Potassium	3.81E+02	2.63E+03	mg/kg	SSH-308 (1 - 2 ft)	10 / 10	-	2.63E+03	EN	N/A	N/A	N	NUT	N/A	N/A
	7782-49-2	Selenium	8.00E-02 J	4.60E+00 J	mg/kg	SSH-4 (1 - 2 ft)	12 / 16	9.1 - 18.4	4.60E+00	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-22-4	Silver	7.40E-03 J	3.02E-01 J	mg/kg	SSH-302 (1 - 2 ft)	10 / 16	0.9 - 3	3.02E-01	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-23-5	Sodium	3.70E+03	3.97E+04	mg/kg	SSH-302 (1 - 2 ft)	10 / 10	-	3.97E+04	EN	N/A	N/A	N	NUT	N/A	N/A
	7440-28-0	Thallium	2.90E-02 J	1.32E-01 J	mg/kg	SSH-302 (1 - 2 ft)	5 / 10	0.026 - 0.24	1.32E-01	7.80E-02 NC	N/A	N/A	Y	ASL	N/A	N/A
	7440-62-2	Vanadium	6.12E+00	4.59E+01	mg/kg	SSH-307 (1 - 2 ft)	10 / 10	-	4.59E+01	3.90E+01 NC	N/A	N/A	Y	ASL	2.95E+01	Y
	7440-66-6	Zinc	4.24E+00	1.16E+02	mg/kg	SSH-307 (1 - 2 ft)	10 / 10	-	1.16E+02	2.30E+03 NC	N/A	N/A	N	BSL	N/A	N/A
		PCBs														
	Tot-PCB-ARO	Total PCB Aroclors	2.20E+00	2.20E+00	mg/kg	SSH-6 (1 - 2 ft)	1 / 16	0.079 - 2.7	2.20E+00	1.20E-01 NC	N/A	N/A	Y	ASL	N/A	N/A

TABLE 3-2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE HYDRIC SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Medium: Hydric Soil
Exposure Medium: Subsurface Hydric Soil (1 - 2 feet)

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)
Off-Project		**SVOCs**														
Red Maple	120-83-2	2,4-Dichlorophenol	7.30E-01	1.80E+00	mg/kg	SSH-301 (1 - 2 ft)	8 / 10	0.32 - 0.74	1.80E+00	1.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A
Swamp / Tidal	120-12-7	Anthracene	4.70E-03 J	4.70E-03 J	mg/kg	SSH-309 (1 - 2 ft)	1 / 10	0.029 - 0.075	4.70E-03	1.80E+03 NC	N/A	N/A	N	BSL	N/A	N/A
Stream Area	50-32-8	Benzo(a)Pyrene	5.50E-03 J	5.20E-02 J	mg/kg	SSH-301 (1 - 2 ft)	6 / 10	0.029 - 0.062	5.20E-02	1.10E-01 C	N/A	N/A	N	BSL	N/A	N/A
	205-99-2	Benzo(b)fluoranthene	1.70E-02 J	1.20E-01 J	mg/kg	SSH-301 (1 - 2 ft)	6 / 10	0.013 - 0.051	1.20E-01	1.10E+00 C	N/A	N/A	N	BSL	N/A	N/A
	191-24-2	Benzo(g,h,i)Perylene	7.70E-03 J	1.20E-02 J	mg/kg	SSH-309 (1 - 2 ft)	2 / 10	0.029 - 0.075	1.20E-02	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	207-08-9	Benzo(k)Fluoranthene	1.10E-02 J	1.30E-02 J	mg/kg	SSH-307 (1 - 2 ft)	2 / 10	0.013 - 0.075	1.30E-02	1.10E+01 C	N/A	N/A	N	BSL	N/A	N/A
	53-70-3	Dibenzo(a,h)Anthracene	6.20E-03 J	9.90E-03 J	mg/kg	SSH-309 (1 - 2 ft)	3 / 10	0.029 - 0.075	9.90E-03	1.10E-01 C	N/A	N/A	N	BSL	N/A	N/A
	193-39-5	Indeno(1,2,3-CD)Pyrene	1.10E-02 J	5.10E-02 J	mg/kg	SSH-301 (1 - 2 ft)	7 / 10	0.013 - 0.03	5.10E-02	1.10E+00 C	N/A	N/A	N	BSL	N/A	N/A
	85-01-8	Phenanthrene	5.10E-03 J	1.10E-01 J	mg/kg	SSH-301 (1 - 2 ft)	7 / 10	0.029 - 0.051	1.10E-01	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	129-00-0	Pyrene	2.30E-02 J	9.20E-02 J	mg/kg	SSH-301 (1 - 2 ft)	2 / 10	0.013 - 0.062	9.20E-02	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A
		VOCs														
	78-93-3	2-Butanone (MEK)	1.19E-02 J	6.89E-02 J	mg/kg	SSH-6 (1 - 2 ft)	6 / 6	-	6.89E-02	2.70E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	67-64-1	Acetone	1.17E-01 J	3.38E-01	mg/kg	SSH-1 (1 - 2 ft)	6 / 6	-	3.38E-01	6.10E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	75-15-0	Carbon Disulfide	1.10E-02 J	1.47E-02 J	mg/kg	SSH-4 (1 - 2 ft)	4 / 6	0.0143 - 0.0181	1.47E-02	7.70E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	108-88-3	Toluene	1.18E-02 J	1.18E-02 J	mg/kg	SSH-6 (1 - 2 ft)	1 / 6	0.0143 - 0.0205	1.18E-02	4.90E+02 NC	N/A	N/A	N	BSL	N/A	N/A

TABLE 3-2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE HYDRIC SOIL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Medium: Hydric Soil
Exposure Medium: Subsurface Hydric Soil (1 - 2 feet)

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Residential RSL (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (5)	Rationale for Selection or Deletion (6)	Background Value (7)	Exceed BTV? (Y/N)

Notes:

Refer to Attachment A for analytical data tables and summary of samples.

ARAR/TBC = Applicable or Relevant and Appropriate Requirements/To be Considered.

BTV = Background Threshold Value.

C = Cancer. Screening value is based on the screening level protective of carcinogenic effects.

CAS = Chemical Abstracts Service.

COPC = Chemical of Potential Concern.

EN = Essential nutrient.

ft = Feet.

L = Lead screening levels developed by USEPA using blood-lead modeling based on target blood lead concentration of 5 micrograms per deciliter (ug/dL).

mg/kg = Milligrams per kilogram.

N/A = Not Applicable or Not Available.

NC = Noncancer. Screening value is based on the screening level protective of noncarcinogenic effects.

PCBs = Polychlorinated biphenyls.

SVOCs = Semivolatile organic compounds.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) Minimum/maximum detected concentration and associated data flags. J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.

(2) Lab Reporting Detection Limits (RDLs) are shown where the frequency of detection is less than 100%.

(3) Maximum detected concentration used for screening.

(4) Screening levels are equal to the USEPA Regional Screening Level (RSL) for residential soil based on a target risk level of 1E-6 for carcinogens and a target hazard quotient of 0.1 for noncarcinogens (May 2020).
The following surrogates were used for chemicals without available screening levels or with multiple forms:
The value for cadmium in the diet was used for cadmium.
The value for trivalent chromium was used for chromium.
The value for manganese non-diet was used for manganese.
The value for mercuric chloride was used for mercury.
The value for Aroclor-1254 was used for total PCBs.
The value for pyrene was used for benzo(g,h,i)perylene and phenanthrene.

(5) Preliminary COPCs are selected as chemicals detected at concentrations greater than residential soil RSLs.

(6) Rationale Codes:
Selection Reason: Above Screening Level (ASL)
Deletion Reason: Below Screening Level (BSL); Essential Nutrient (NUT)

(7) Equal to the Background Threshold Value (BTV) calculated for chemicals identified as preliminary COPCs within the associated medium and exposure point (area), as described in the report text.

TABLE 3-2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - GROUNDWATEF
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Background Value (4)	Screening Toxicity Value (NC/C) (5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (6)	Rationale for Selection or Deletion (7)
On-Project		**Inorganics**													
Blue Beach Area	7429-90-5	Aluminum	6.86E+01 J	1.61E+02	ug/L	BB-3 (14.46 - 14.46 ft)	4 / 13	40 - 40	1.61E+02	N/A	2.00E+03 NC	N/A	N/A	N	BSL
	7440-36-0	Antimony	1.20E-01 J	2.22E+00	ug/L	MW-104 (9.66 - 9.66 ft)	3 / 13	0.5 - 0.5	2.22E+00	N/A	7.80E-01 NC	6.00E+00	MCL	Y	ASL
	7440-38-2	Arsenic	5.00E-01 J	1.15E+01	ug/L	BB-3 (14.46 - 14.46 ft)	16 / 44	1 - 4	1.15E+01	N/A	5.20E-02 C	1.00E+01	MCL	Y	ASL
	7440-39-3	Barium	1.60E+00 J	8.52E+02 J	ug/L	TS-UP-1 (39 - 40 ft)	41 / 44	1 - 3	8.52E+02	N/A	3.80E+02 NC	2.00E+03	MCL	Y	ASL
	7440-41-7	Beryllium	4.40E-02 J	1.40E-01 J	ug/L	MW-108D (12.25 - 12.25 ft)	5 / 13	0.2 - 0.2	1.40E-01	N/A	2.50E+00 NC	4.00E+00	MCL	N	BSL
	7440-43-9	Cadmium	3.50E-02 J	3.12E+01	ug/L	MW-108S (12.36 - 12.36 ft)	26 / 43	0.1 - 0.5	3.12E+01	N/A	9.20E-01 NC	5.00E+00	MCL	Y	ASL
	7440-70-2	Calcium	2.35E+03	7.55E+04	ug/L	MW-108S (12.36 - 12.36 ft)	13 / 13	-	7.55E+04	N/A	EN	N/A	N/A	N	NUT
	7440-47-3	Chromium	1.50E+00 J	6.24E+02 J	ug/L	TS-UP-1 (39 - 40 ft)	17 / 44	3 - 4	6.24E+02	N/A	2.20E+03 NC	1.00E+02	MCL	Y	ASL
	7440-48-4	Cobalt	6.80E-02 J	6.56E+00	ug/L	OW-9 (12.45 - 12.45 ft)	11 / 13	0.3 - 0.3	6.56E+00	N/A	6.00E-01 NC	N/A	N/A	Y	ASL
	7440-50-8	Copper	3.62E+00	3.77E+00	ug/L	BB-3 (14.46 - 14.46 ft)	4 / 13	2 - 2	3.77E+00	N/A	8.00E+01 NC	1.30E+03	MCL	N	BSL
	7439-89-6	Iron	6.10E+01 J	6.82E+04	ug/L	BB-3 (14.46 - 14.46 ft)	9 / 13	60 - 60	6.82E+04	N/A	1.40E+03 NC	N/A	N/A	Y	ASL
	7439-92-1	Lead	8.10E-02 J	2.75E+02 J	ug/L	TS-UP-1 (39 - 40 ft)	20 / 44	0.5 - 1	2.75E+02	N/A	1.50E+01	1.50E+01	MCL	Y	ASL
	7439-95-4	Magnesium	2.74E+02	9.11E+03	ug/L	MW-108S (12.36 - 12.36 ft)	13 / 13	-	9.11E+03	N/A	EN	N/A	N/A	N	NUT
	7439-96-5	Manganese	1.40E+00 J	3.18E+03	ug/L	OW-9 (12.45 - 12.45 ft)	13 / 13	-	3.18E+03	N/A	4.30E+01 NC	N/A	N/A	Y	ASL
	7439-97-6	Mercury	1.30E-02 J	1.30E-02 J	ug/L	BB-3 (14.46 - 14.46 ft)	1 / 44	0.1 - 0.2	1.30E-02	N/A	5.70E-01 NC	2.00E+00	MCL	N	BSL
	7440-02-0	Nickel	2.40E-01 JJ	3.63E+00	ug/L	OW-3 (9.65 - 9.65 ft)	7 / 13	1.2 - 1.2	3.63E+00	N/A	3.90E+01 NC	N/A	N/A	N	BSL
	7440-09-7	Potassium	6.70E+02 J	1.60E+04	ug/L	MW-107 (13.31 - 13.31 ft)	11 / 13	400 - 400	1.60E+04	N/A	EN	N/A	N/A	N	NUT
	7782-49-2	Selenium	1.90E-01 J	1.00E+00 J	ug/L	TS-3-C (14 - 15 ft)	4 / 44	2 - 6	1.00E+00	N/A	1.00E+01 NC	5.00E+01	MCL	N	BSL
	7440-22-4	Silver	1.30E-01 J	1.70E-01 J	ug/L	BMW-3 (7.32 - 17.39 ft)	2 / 44	0.1 - 0.4	1.70E-01	N/A	9.40E+00 NC	N/A	N/A	N	BSL
	7440-23-5	Sodium	2.63E+03	1.70E+05	ug/L	BB-4 (13.7 - 13.7 ft)	13 / 13	-	1.70E+05	N/A	EN	N/A	N/A	N	NUT
	7440-66-6	Zinc	4.00E+00 J	1.16E+02	ug/L	OW-9 (12.45 - 12.45 ft)	10 / 13	8 - 8	1.16E+02	N/A	6.00E+02 NC	N/A	N/A	N	BSL
		SVOCs													
	90-12-0	1-Methylnaphthalene	3.80E-01	9.00E+01	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	9.00E+01	N/A	1.10E+00 C	N/A	N/A	Y	ASL
	91-57-6	2-Methylnaphthalene	3.15E+01 J	8.50E+01	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 13	0.093 - 0.098	8.50E+01	N/A	3.60E+00 NC	N/A	N/A	Y	ASL
	83-32-9	Acenaphthene	1.60E-01 J	2.15E-01 J	ug/L	BB-3 (14.46 - 14.46 ft)	2 / 13	0.093 - 0.098	2.15E-01	N/A	5.30E+01 NC	N/A	N/A	N	BSL
	120-12-7	Anthracene	1.20E-01 J	1.20E-01 J	ug/L	BMW-3 (9.71 - 9.71 ft)	1 / 13	0.093 - 0.098	1.20E-01	N/A	1.80E+02 NC	N/A	N/A	N	BSL
	56-55-3	Benzo(a)anthracene	5.10E-02 J	2.60E-01	ug/L	MW-101D (7.04 - 7.04 ft)	5 / 13	0.093 - 0.098	2.60E-01	N/A	3.00E-02 C	N/A	N/A	Y	ASL
	50-32-8	Benzo(a)Pyrene	7.45E-02 J	2.20E-01	ug/L	BB-4 (13.7 - 13.7 ft); BMW-3 (9.71 - 9.71 ft)	4 / 13	0.093 - 0.098	2.20E-01	N/A	2.50E-02 C	2.00E-01	MCL	Y	ASL
	205-99-2	Benzo(b)fluoranthene	9.50E-02 J	3.80E-01	ug/L	BB-4 (13.7 - 13.7 ft)	4 / 13	0.093 - 0.098	3.80E-01	N/A	2.50E-01 C	N/A	N/A	Y	ASL
	191-24-2	Benzo(g,h,i)Perylene	8.30E-02 J	3.20E-01	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	3.20E-01	N/A	1.20E+01 NC	N/A	N/A	N	BSL
	207-08-9	Benzo(k)Fluoranthene	7.20E-02 J	1.70E-01 J	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	1.70E-01	N/A	2.50E+00 C	N/A	N/A	N	BSL
	218-01-9	Chrysene	5.10E-02 J	2.50E-01	ug/L	BMW-3 (9.71 - 9.71 ft)	5 / 13	0.093 - 0.098	2.50E-01	N/A	2.50E+01 C	N/A	N/A	N	BSL
	206-44-0	Fluoranthene	7.70E-02 J	5.30E-01	ug/L	BMW-3 (9.71 - 9.71 ft)	7 / 13	0.093 - 0.098	5.30E-01	N/A	8.00E+01 NC	N/A	N/A	N	BSL
	86-73-7	Fluorene	6.10E-02 J	4.35E-01 J	ug/L	BB-3 (14.46 - 14.46 ft)	3 / 13	0.093 - 0.098	4.35E-01	N/A	2.90E+01 NC	N/A	N/A	N	BSL
	193-39-5	Indeno(1,2,3-CD)Pyrene	1.40E-01 J	2.30E-01	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	2.30E-01	N/A	2.50E-01 C	N/A	N/A	N	BSL
	91-20-3	Naphthalene	9.20E-02 J	2.50E+02	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	2.50E+02	N/A	1.20E-01 C	N/A	N/A	Y	ASL

TABLE 3-2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - GROUNDWATEF
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Background Value (4)	Screening Toxicity Value (NC/C) (5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (6)	Rationale for Selection or Deletion (7)
On-Project	85-01-8	Phenanthrene	1.09E-01 J	5.20E-01	ug/L	BMW-3 (9.71 - 9.71 ft)	3 / 13	0.093 - 0.098	5.20E-01	N/A	1.20E+01 NC	N/A	N/A	N	BSL
Blue Beach Area	129-00-0	Pyrene	8.90E-02 J	2.90E-01	ug/L	BMW-3 (9.71 - 9.71 ft)	5 / 13	0.093 - 0.098	2.90E-01	N/A	1.20E+01 NC	N/A	N/A	N	BSL
		VOCs													
	71-55-6	1,1,1-Trichloroethane	1.70E-01 J	1.90E-01 J	ug/L	TS-3-D (13 - 15 ft)	2 / 46	0.25 - 5	1.90E-01	N/A	8.00E+02 NC	2.00E+02	MCL	N	BSL
	79-34-5	1,1,2,2-Tetrachloroethane	2.00E-01 J	2.00E-01 J	ug/L	MW-107 (8 - 18 ft)	1 / 46	0.2 - 2	2.00E-01	N/A	7.60E-02 C	N/A	N/A	Y	ASL
	79-00-5	1,1,2-Trichloroethane	3.70E-01 J	4.00E-01 J	ug/L	MW-107 (8 - 18 ft)	2 / 46	0.25 - 5	4.00E-01	N/A	4.10E-02 NC	5.00E+00	MCL	Y	ASL
	75-34-3	1,1-Dichloroethane	1.20E-01 J	3.20E+00	ug/L	TS-3-D (19 - 21 ft)	5 / 46	0.25 - 5	3.20E+00	N/A	2.80E+00 C	N/A	N/A	Y	ASL
	75-35-4	1,1-Dichloroethene	1.40E-01 J	2.40E-01 J	ug/L	TS-3-B (39 - 40 ft)	2 / 46	0.25 - 5	2.40E-01	N/A	2.80E+01 NC	7.00E+00	MCL	N	BSL
	120-82-1	1,2,4-Trichlorobenzene	2.80E-01 J	2.80E-01 J	ug/L	TS-3-A (28 - 30 ft)	1 / 46	0.25 - 5	2.80E-01	N/A	4.00E-01 NC	7.00E+01	MCL	N	BSL
	95-63-6	1,2,4-Trimethylbenzene	8.00E-02 J	3.20E+02 J	ug/L	BB-4 (13.7 - 13.7 ft)	8 / 46	0.2 - 2	3.20E+02	N/A	5.60E+00 NC	N/A	N/A	Y	ASL
	95-50-1	1,2-Dichlorobenzene	2.20E-01 J	2.20E-01 J	ug/L	TS-3-A (28 - 30 ft)	1 / 46	0.2 - 2	2.20E-01	N/A	3.00E+01 NC	6.00E+02	MCL	N	BSL
	78-87-5	1,2-Dichloropropane	9.40E-01	9.40E-01	ug/L	TS-3-D (13 - 15 ft)	1 / 46	0.25 - 5	9.40E-01	N/A	8.20E-01 NC	5.00E+00	MCL	Y	ASL
	108-67-8	1,3,5-Trimethylbenzene	1.10E-01 J	4.20E+00	ug/L	TS-3-A (17 - 20 ft)	4 / 46	0.2 - 2	4.20E+00	N/A	6.00E+00 NC	N/A	N/A	N	BSL
	99-87-6	4-Isopropyltoluene	1.00E-01 J	1.10E+01 J	ug/L	BB-4 (13.7 - 13.7 ft)	5 / 46	0.2 - 2	1.10E+01	N/A	4.50E+01 NC	N/A	N/A	N	BSL
	67-64-1	Acetone	1.10E+01	2.42E+01	ug/L	OW-9 (10 - 20 ft)	3 / 46	2.5 - 50	2.42E+01	N/A	1.40E+03 NC	N/A	N/A	N	BSL
	71-43-2	Benzene	1.00E-01 J	2.80E-01 J	ug/L	TS-3-A (17 - 20 ft)	7 / 46	0.2 - 2	2.80E-01	N/A	4.60E-01 C	5.00E+00	MCL	N	BSL
	75-15-0	Carbon Disulfide	1.00E+00	1.00E+00	ug/L	TS-3-A (28 - 30 ft)	1 / 46	0.2 - 2	1.00E+00	N/A	8.10E+01 NC	N/A	N/A	N	BSL
	67-66-3	Chloroform	1.00E-01 J	6.30E-01	ug/L	TS-3-D (19 - 21 ft)	4 / 46	0.25 - 5	6.30E-01	N/A	2.20E-01 C	8.00E+01	MCL	Y	ASL
	74-87-3	Chloromethane	4.70E-01 J	5.10E-01 J	ug/L	TS-3-D (19 - 21 ft)	3 / 46	0.25 - 5	5.10E-01	N/A	1.90E+01 NC	N/A	N/A	N	BSL
	156-59-2	cis-1,2-Dichloroethene	1.30E-01 J	3.92E+01 J	ug/L	OW-3 (20.5 - 30.5 ft)	20 / 46	0.25 - 0.5	3.92E+01	N/A	3.60E+00 NC	7.00E+01	MCL	Y	ASL
	75-71-8	Dichlorodifluoromethane	1.20E+00	2.90E+00	ug/L	TS-3-B (15 - 17 ft)	2 / 46	0.25 - 10	2.90E+00	N/A	2.00E+01 NC	N/A	N/A	N	BSL
	100-41-4	Ethylbenzene	8.00E-02 J	7.50E+00	ug/L	TS-3-A (17 - 20 ft)	6 / 46	0.2 - 2	7.50E+00	N/A	1.50E+00 C	7.00E+02	MCL	Y	ASL
	98-82-8	Isopropylbenzene	1.10E-01 J	1.80E+01 J	ug/L	BB-4 (13.7 - 13.7 ft)	9 / 46	0.2 - 2	1.80E+01	N/A	4.50E+01 NC	N/A	N/A	N	BSL
	75-09-2	Methylene Chloride	1.60E-01 J	2.60E-01 J	ug/L	TS-3-D (19 - 21 ft)	5 / 46	0.25 - 5	2.60E-01	N/A	1.10E+01 NC	5.00E+00	MCL	N	BSL
	91-20-3	Naphthalene	1.80E-01 J	7.80E+02	ug/L	TS-3-A (17 - 20 ft)	11 / 33	0.25 - 5	7.80E+02	N/A	1.20E-01 C	N/A	N/A	Y	ASL
	104-51-8	n-Butylbenzene	2.10E-01 J	6.30E+00 J	ug/L	BB-4 (13.7 - 13.7 ft)	4 / 46	0.2 - 2	6.30E+00	N/A	1.00E+02 NC	N/A	N/A	N	BSL
	103-65-1	n-Propylbenzene	7.00E-01 J	2.60E+01 J	ug/L	BB-4 (13.7 - 13.7 ft)	4 / 46	0.25 - 5	2.60E+01	N/A	6.60E+01 NC	N/A	N/A	N	BSL
	135-98-8	sec-Butylbenzene	5.60E-01	8.90E+00 J	ug/L	BB-4 (13.7 - 13.7 ft)	16 / 46	0.2 - 0.5	8.90E+00	N/A	2.00E+02 NC	N/A	N/A	N	BSL
	98-06-6	tert-Butylbenzene	2.00E-01 J	5.00E+00 J	ug/L	BB-4 (13.7 - 13.7 ft)	20 / 46	0.2 - 0.5	5.00E+00	N/A	6.90E+01 NC	N/A	N/A	N	BSL
	127-18-4	Tetrachloroethene	1.30E-01 J	5.80E+00	ug/L	MW-107 (8 - 18 ft)	18 / 46	0.25 - 5	5.80E+00	N/A	4.10E+00 NC	5.00E+00	MCL	Y	ASL
	108-88-3	Toluene	8.00E-02 J	1.00E+00	ug/L	TS-3-A (17 - 20 ft)	11 / 46	0.2 - 2	1.00E+00	N/A	1.10E+02 NC	1.00E+03	MCL	N	BSL
	Tot-Xylenes	Total Xylenes	3.10E-01	4.10E+01	ug/L	BB-4 (13.7 - 13.7 ft)	7 / 46	0.6 - 6	4.10E+01	N/A	1.90E+01 NC	1.00E+04	MCL	Y	ASL
	156-60-5	trans-1,2-Dichloroethene	1.50E-01 J	4.10E-01 J	ug/L	TS-3-D (19 - 21 ft)	2 / 46	0.25 - 5	4.10E-01	N/A	3.60E+01 NC	1.00E+02	MCL	N	BSL
	79-01-6	Trichloroethylene	1.10E-01 J	1.80E+02	ug/L	TS-3-D (19 - 21 ft)	25 / 46	0.25 - 0.5	1.80E+02	N/A	2.80E-01 NC	5.00E+00	MCL	Y	ASL
	75-01-4	Vinyl Chloride	1.20E+00	2.00E+00	ug/L	TS-3-A (17 - 20 ft)	2 / 46	0.25 - 5	2.00E+00	N/A	1.90E-02 C	2.00E+00	MCL	Y	ASL

TABLE 3-2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - GROUNDWATEF
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Background Value (4)	Screening Toxicity Value (NC/C) (5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N) (6)	Rationale for Selection or Deletion (7)

Notes:

Refer to Attachment A for analytical data tables and summary of samples.

ARAR/TBC = Applicable or Relevant and Appropriate Requirements/To be Considered.

C = Cancer. Screening value is based on the screening level protective of carcinogenic effects.

CAS = Chemical Abstracts Service.

COPC = Chemical of Potential Concern.

EN = Essential nutrient.

MCL = USEPA Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html, accessed September 2020).

ug/L = Micrograms per liter.

N/A = Not Applicable or Not Available.

NC = Noncancer. Screening value is based on the screening level protective of noncarcinogenic effects.

SVOCs = Semivolatile organic compounds.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) Minimum/maximum detected concentration and associated data flags.

J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.

(2) Lab Reporting Detection Limits (RDLs) are shown where the frequency of detection is less than 100%.

(3) Maximum detected concentration used for screening.

(4) A background dataset is not available for groundwater.

(5) Screening levels are equal to the USEPA Regional Screening Level (RSL) for tapwater based on a target risk level of 1E-6 for carcinogens and a target hazard quotient of 0.1 for noncarcinogens (May 2020).

Value for lead is the Safe Drinking Water Act (SDWA) action level, presented on the USEPA MCL table.

The following surrogates were used for chemicals without available screening levels or with multiple forms:

The value for cadmium in water was used for cadmium.

The value for trivalent chromium was used for chromium.

The value for manganese non-diet was used for manganese.

The value for mercuric chloride was used for mercury.

The value for pyrene was used for benzo(g,h,i)perylene and phenanthrene.

The value for isopropylbenzene (cumene) was used for 4-isopropyltoluene.

(6) Chemicals detected at concentrations greater than either the screening toxicity level or ARAR are selected as preliminary COPCs.

(7) Rationale Codes:

Selection Reason: Above Screening Level (ASL)

Deletion Reason: Below Screening Level (BSL); Essential Nutrient (NUT)

TABLE 3-2.6
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SHALLOW GROUNDWATER
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Background Value (4)	Screening Toxicity Value (NC/C) (5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N)	Rationale for Selection or Deletion (6)
On-Project		**Inorganics**													
Blue Beach Area	7429-90-5	Aluminum	6.86E+01 J	1.61E+02	ug/L	BB-3 (14.46 - 14.46 ft)	4 / 13	40 - 40	1.61E+02	N/A	2.00E+03 NC	N/A	N/A	N	BSL
	7440-36-0	Antimony	1.20E-01 J	2.22E+00	ug/L	MW-104 (9.66 - 9.66 ft)	3 / 13	0.5 - 0.5	2.22E+00	N/A	7.80E-01 NC	6.00E+00	MCL	Y	ASL
	7440-38-2	Arsenic	2.90E+00 J	1.15E+01	ug/L	BB-3 (14.46 - 14.46 ft)	4 / 21	1 - 4	1.15E+01	N/A	5.20E-02 C	1.00E+01	MCL	Y	ASL
	7440-39-3	Barium	1.60E+00 J	9.91E+01	ug/L	MW-108S (12.36 - 12.36 ft)	19 / 21	1 - 3	9.91E+01	N/A	3.80E+02 NC	2.00E+03	MCL	N	BSL
	7440-41-7	Beryllium	4.40E-02 J	1.40E-01 J	ug/L	MW-108D (12.25 - 12.25 ft)	5 / 13	0.2 - 0.2	1.40E-01	N/A	2.50E+00 NC	4.00E+00	MCL	N	BSL
	7440-43-9	Cadmium	3.50E-02 J	3.12E+01	ug/L	MW-108S (12.36 - 12.36 ft)	13 / 21	0.1 - 0.5	3.12E+01	N/A	9.20E-01 NC	5.00E+00	MCL	Y	ASL
	7440-70-2	Calcium	2.35E+03	7.55E+04	ug/L	MW-108S (12.36 - 12.36 ft)	13 / 13	-	7.55E+04	N/A	EN	N/A	N/A	N	NUT
	7440-47-3	Chromium	1.50E+00 J	9.68E+00	ug/L	MW-108S (12.36 - 12.36 ft)	3 / 21	3 - 4	9.68E+00	N/A	2.20E+03 NC	1.00E+02	MCL	N	BSL
	7440-48-4	Cobalt	6.80E-02 J	6.56E+00	ug/L	OW-9 (12.45 - 12.45 ft)	11 / 13	0.3 - 0.3	6.56E+00	N/A	6.00E-01 NC	N/A	N/A	Y	ASL
	7440-50-8	Copper	3.62E+00	3.77E+00	ug/L	BB-3 (14.46 - 14.46 ft)	4 / 13	2 - 2	3.77E+00	N/A	8.00E+01 NC	1.30E+03	MCL	N	BSL
	7439-89-6	Iron	6.10E+01 J	6.82E+04	ug/L	BB-3 (14.46 - 14.46 ft)	9 / 13	60 - 60	6.82E+04	N/A	1.40E+03 NC	N/A	N/A	Y	ASL
	7439-92-1	Lead	8.10E-02 J	3.40E+00 J	ug/L	TS-3-D (13 - 15 ft)	7 / 21	0.5 - 1	3.40E+00	N/A	1.50E+01	1.50E+01	MCL	N	BSL
	7439-95-4	Magnesium	2.74E+02	9.11E+03	ug/L	MW-108S (12.36 - 12.36 ft)	13 / 13	-	9.11E+03	N/A	EN	N/A	N/A	N	NUT
	7439-96-5	Manganese	1.40E+00 J	3.18E+03	ug/L	OW-9 (12.45 - 12.45 ft)	13 / 13	-	3.18E+03	N/A	4.30E+01 NC	N/A	N/A	Y	ASL
	7439-97-6	Mercury	1.30E-02 J	1.30E-02 J	ug/L	BB-3 (14.46 - 14.46 ft)	1 / 21	0.1 - 0.2	1.30E-02	N/A	5.70E-01 NC	2.00E+00	MCL	N	BSL
	7440-02-0	Nickel	2.40E-01 J	3.63E+00	ug/L	OW-3 (9.65 - 9.65 ft)	7 / 13	1.2 - 1.2	3.63E+00	N/A	3.90E+01 NC	N/A	N/A	N	BSL
	7440-09-7	Potassium	6.70E+02 J	1.60E+04	ug/L	MW-107 (13.31 - 13.31 ft)	11 / 13	400 - 400	1.60E+04	N/A	EN	N/A	N/A	N	NUT
	7782-49-2	Selenium	1.90E-01 J	1.00E+00 J	ug/L	TS-3-C (14 - 15 ft)	4 / 21	2 - 6	1.00E+00	N/A	1.00E+01 NC	5.00E+01	MCL	N	BSL
	7440-22-4	Silver	1.30E-01 J	1.30E-01 J	ug/L	TS-3-C (14 - 15 ft)	1 / 21	0.1 - 0.4	1.30E-01	N/A	9.40E+00 NC	N/A	N/A	N	BSL
	7440-23-5	Sodium	2.63E+03	1.70E+05	ug/L	BB-4 (13.7 - 13.7 ft)	13 / 13	-	1.70E+05	N/A	EN	N/A	N/A	N	NUT
	7440-66-6	Zinc	4.00E+00 J	1.16E+02	ug/L	OW-9 (12.45 - 12.45 ft)	10 / 13	8 - 8	1.16E+02	N/A	6.00E+02 NC	N/A	N/A	N	BSL
		SVOCs													
	90-12-0	1-Methylnaphthalene	3.80E-01	9.00E+01	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	9.00E+01	N/A	1.10E+00 C	N/A	N/A	Y	ASL
	91-57-6	2-Methylnaphthalene	3.15E+01 J	8.50E+01	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 13	0.093 - 0.098	8.50E+01	N/A	3.60E+00 NC	N/A	N/A	Y	ASL
	83-32-9	Acenaphthene	1.60E-01 J	2.15E-01 J	ug/L	BB-3 (14.46 - 14.46 ft)	2 / 13	0.093 - 0.098	2.15E-01	N/A	5.30E+01 NC	N/A	N/A	N	BSL
	120-12-7	Anthracene	1.20E-01 J	1.20E-01 J	ug/L	BMW-3 (9.71 - 9.71 ft)	1 / 13	0.093 - 0.098	1.20E-01	N/A	1.80E+02 NC	N/A	N/A	N	BSL
	56-55-3	Benzo(a)anthracene	5.10E-02 J	2.60E-01	ug/L	MW-101D (7.04 - 7.04 ft)	5 / 13	0.093 - 0.098	2.60E-01	N/A	3.00E-02 C	N/A	N/A	Y	ASL
	50-32-8	Benzo(a)Pyrene	7.45E-02 J	2.20E-01	ug/L	BB-4 (13.7 - 13.7 ft); BMW-3 (9.71 - 9.71 ft)	4 / 13	0.093 - 0.098	2.20E-01	N/A	2.50E-02 C	2.00E-01	MCL	Y	ASL
	205-99-2	Benzo(b)fluoranthene	9.50E-02 J	3.80E-01	ug/L	BB-4 (13.7 - 13.7 ft)	4 / 13	0.093 - 0.098	3.80E-01	N/A	2.50E-01 C	N/A	N/A	Y	ASL
	191-24-2	Benzo(g,h,i)Perylene	8.30E-02 J	3.20E-01	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	3.20E-01	N/A	1.20E+01 NC	N/A	N/A	N	BSL
	207-08-9	Benzo(k)Fluoranthene	7.20E-02 J	1.70E-01 J	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	1.70E-01	N/A	2.50E+00 C	N/A	N/A	N	BSL
	218-01-9	Chrysene	5.10E-02 J	2.50E-01	ug/L	BMW-3 (9.71 - 9.71 ft)	5 / 13	0.093 - 0.098	2.50E-01	N/A	2.50E+01 C	N/A	N/A	N	BSL
	206-44-0	Fluoranthene	7.70E-02 J	5.30E-01	ug/L	BMW-3 (9.71 - 9.71 ft)	7 / 13	0.093 - 0.098	5.30E-01	N/A	8.00E+01 NC	N/A	N/A	N	BSL
	86-73-7	Fluorene	6.10E-02 J	4.35E-01 J	ug/L	BB-3 (14.46 - 14.46 ft)	3 / 13	0.093 - 0.098	4.35E-01	N/A	2.90E+01 NC	N/A	N/A	N	BSL
	193-39-5	Indeno(1,2,3-CD)Pyrene	1.40E-01 J	2.30E-01	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	2.30E-01	N/A	2.50E-01 C	N/A	N/A	N	BSL
	91-20-3	Naphthalene	9.20E-02 J	2.50E+02	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	2.50E+02	N/A	1.20E-01 C	N/A	N/A	Y	ASL

TABLE 3-2.6
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SHALLOW GROUNDWATER
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Background Value (4)	Screening Toxicity Value (NC/C) (5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N)	Rationale for Selection or Deletion (6)
On-Project	85-01-8	Phenanthrene	1.09E-01 J	5.20E-01	ug/L	BMW-3 (9.71 - 9.71 ft)	3 / 13	0.093 - 0.098	5.20E-01	N/A	1.20E+01 NC	N/A	N/A	N	BSL
Blue Beach Area	129-00-0	Pyrene	8.90E-02 J	2.90E-01	ug/L	BMW-3 (9.71 - 9.71 ft)	5 / 13	0.093 - 0.098	2.90E-01	N/A	1.20E+01 NC	N/A	N/A	N	BSL
		VOCs													
	71-55-6	1,1,1-Trichloroethane	1.70E-01 J	1.90E-01 J	ug/L	TS-3-D (13 - 15 ft)	2 / 21	0.25 - 0.5	1.90E-01	N/A	8.00E+02 NC	2.00E+02	MCL	N	BSL
	75-34-3	1,1-Dichloroethane	1.30E-01 J	2.60E-01 J	ug/L	TS-3-D (13 - 15 ft)	2 / 21	0.25 - 0.5	2.60E-01	N/A	2.80E+00 C	N/A	N/A	N	BSL
	95-63-6	1,2,4-Trimethylbenzene	2.60E-01 J	3.20E+02 J	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 21	0.2 - 0.5	3.20E+02	N/A	5.60E+00 NC	N/A	N/A	Y	ASL
	78-87-5	1,2-Dichloropropane	9.40E-01	9.40E-01	ug/L	TS-3-D (13 - 15 ft)	1 / 21	0.25 - 0.5	9.40E-01	N/A	8.20E-01 NC	5.00E+00	MCL	Y	ASL
	99-87-6	4-Isopropyltoluene	2.50E+00	1.10E+01 J	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 21	0.2 - 0.5	1.10E+01	N/A	4.50E+01 NC	N/A	N/A	N	BSL
	67-64-1	Acetone	1.10E+01	1.10E+01	ug/L	BB-3 (14.46 - 14.46 ft)	1 / 21	2.5 - 5	1.10E+01	N/A	1.40E+03 NC	N/A	N/A	N	BSL
	67-66-3	Chloroform	1.30E-01 J	1.90E-01 J	ug/L	TS-3-D (13 - 15 ft)	2 / 21	0.25 - 0.5	1.90E-01	N/A	2.20E-01 C	8.00E+01	MCL	N	BSL
	156-59-2	cis-1,2-Dichloroethene	7.20E-01 J	8.40E+00	ug/L	OW-3 (9.65 - 9.65 ft)	6 / 21	0.25 - 0.5	8.40E+00	N/A	3.60E+00 NC	7.00E+01	MCL	Y	ASL
	100-41-4	Ethylbenzene	4.30E+00	4.80E+00 J	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 21	0.2 - 0.5	4.80E+00	N/A	1.50E+00 C	7.00E+02	MCL	Y	ASL
	98-82-8	Isopropylbenzene	1.10E+01	1.80E+01 J	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 21	0.2 - 0.5	1.80E+01	N/A	4.50E+01 NC	N/A	N/A	N	BSL
	104-51-8	n-Butylbenzene	2.45E+00	6.30E+00 J	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 21	0.2 - 0.5	6.30E+00	N/A	1.00E+02 NC	N/A	N/A	N	BSL
	103-65-1	n-Propylbenzene	1.20E+01	2.60E+01 J	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 21	0.25 - 0.5	2.60E+01	N/A	6.60E+01 NC	N/A	N/A	N	BSL
	135-98-8	sec-Butylbenzene	8.10E-01 J	8.90E+00 J	ug/L	BB-4 (13.7 - 13.7 ft)	4 / 21	0.2 - 0.5	8.90E+00	N/A	2.00E+02 NC	N/A	N/A	N	BSL
	98-06-6	tert-Butylbenzene	4.80E-01 J	5.00E+00 J	ug/L	BB-4 (13.7 - 13.7 ft)	4 / 21	0.2 - 0.5	5.00E+00	N/A	6.90E+01 NC	N/A	N/A	N	BSL
	127-18-4	Tetrachloroethene	2.20E-01 J	1.80E+00	ug/L	TS-3-D (13 - 15 ft)	5 / 21	0.25 - 0.5	1.80E+00	N/A	4.10E+00 NC	5.00E+00	MCL	N	BSL
	108-88-3	Toluene	1.10E-01 J	1.10E-01 J	ug/L	TS-3-C (14 - 15 ft)	1 / 21	0.2 - 0.5	1.10E-01	N/A	1.10E+02 NC	1.00E+03	MCL	N	BSL
	Tot-Xylenes	Total Xylenes	4.10E+01	4.10E+01	ug/L	BB-4 (13.7 - 13.7 ft)	1 / 21	0.6 - 1.5	4.10E+01	N/A	1.90E+01 NC	1.00E+04	MCL	Y	ASL
	79-01-6	Trichloroethylene	1.40E+00	7.50E+01	ug/L	TS-3-D (13 - 15 ft)	7 / 21	0.25 - 0.5	7.50E+01	N/A	2.80E-01 NC	5.00E+00	MCL	Y	ASL

TABLE 3-2.6
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SHALLOW GROUNDWATER
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Shallow Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Background Value (4)	Screening Toxicity Value (NC/C) (5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N)	Rationale for Selection or Deletion (6)

Notes:

Refer to Attachment A for analytical data tables and summary of samples.

ARAR/TBC = Applicable or Relevant and Appropriate Requirements/To be Considered.

C = Cancer. Screening value is based on the screening level protective of carcinogenic effects.

CAS = Chemical Abstracts Service.

COPC = Chemical of Potential Concern.

EN = Essential nutrient.

MCL = USEPA Maximum Contaminant Level (http://www.epa.gov/safewater/contaminants/index.html, accessed September 2020).

ug/L = Micrograms per liter.

N/A = Not Applicable or Not Available.

NC = Noncancer. Screening value is based on the screening level protective of noncarcinogenic effects.

SVOCs = Semivolatile organic compounds.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) Minimum/maximum detected concentration and associated data flags.

J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.

(2) Lab Reporting Detection Limits (RDLs) are shown where the frequency of detection is less than 100%.

(3) Maximum detected concentration used for screening.

(4) A background dataset is not available for groundwater.

(5) Screening levels are equal to the USEPA Regional Screening Level (RSL) for tapwater based on a target risk level of 1E-6 for carcinogens and a target hazard quotient of 0.1 for noncarcinogens (May 2020).

Value for lead is the Safe Drinking Water Act (SDWA) action level, presented on the USEPA MCL table.

The following surrogates were used for chemicals without available screening levels or with multiple forms:

The value for cadmium in water was used for cadmium.

The value for trivalent chromium was used for chromium.

The value for manganese non-diet was used for manganese.

The value for mercuric chloride was used for mercury.

The value for pyrene was used for benzo(g,h,i)perylene and phenanthrene.

The value for isopropylbenzene (cumene) was used for 4-isopropyltoluene.

(6) Rationale Codes:

Selection Reason: Above Screening Level (ASL)

Deletion Reason: Below Screening Level (BSL); Essential Nutrient (NUT)

TABLE 3-2.7
OCCURRENCE, DISTRIBUTION AND SCREENING EVALUATION FOR THE SHALLOW GROUNDWATER TO INDOOR AIR (VAPOR INTRUSION) PATHWAY
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater (Vapor Intrusion to Indoor Air)

Exposure Point	CAS Number	Chemicals	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Background Value (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Residential VISL (NC/C) (5)	Exceed Residential VISL? (Y/N)	Industrial VISL (NC/C) (5)	Exceed Industrial VISL? (Y/N)
On-Project		**Inorganics**														
Blue Beach Area	7439-97-6	Mercury	1.30E-02 J	1.30E-02 J	ug/L	BB-3 (14.46 - 14.46 ft)	1 / 21	0.1 - 0.2	1.30E-02	N/A	N/A	N/A	8.89E-02 NC	N	3.73E-01 NC	N
		SVOCs														
	90-12-0	1-Methylnaphthalene	3.80E-01	9.00E+01	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	9.00E+01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	91-57-6	2-Methylnaphthalene	3.15E+01 J	8.50E+01	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 13	0.093 - 0.098	8.50E+01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	83-32-9	Acenaphthene	1.60E-01 J	2.15E-01 J	ug/L	BB-3 (14.46 - 14.46 ft)	2 / 13	0.093 - 0.098	2.15E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	120-12-7	Anthracene	1.20E-01 J	1.20E-01 J	ug/L	BMW-3 (9.71 - 9.71 ft)	1 / 13	0.093 - 0.098	1.20E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	56-55-3	Benzo(a)anthracene	5.10E-02 J	2.60E-01	ug/L	MW-101D (7.04 - 7.04 ft)	5 / 13	0.093 - 0.098	2.60E-01	N/A	N/A	N/A	3.44E+01 C	N	4.17E+02 C	N
	191-24-2	Benzo(g,h,i)Perylene	8.30E-02 J	3.20E-01	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	3.20E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	86-73-7	Fluorene	6.10E-02 J	4.35E-01 J	ug/L	BB-3 (14.46 - 14.46 ft)	3 / 13	0.093 - 0.098	4.35E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	91-20-3	Naphthalene	9.20E-02 J	2.50E+02	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 13	0.093 - 0.098	2.50E+02	N/A	N/A	N/A	4.59E+00 C	Y	2.01E+01 C	Y
	85-01-8	Phenanthrene	1.09E-01 J	5.20E-01	ug/L	BMW-3 (9.71 - 9.71 ft)	3 / 13	0.093 - 0.098	5.20E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	129-00-0	Pyrene	8.90E-02 J	2.90E-01	ug/L	BMW-3 (9.71 - 9.71 ft)	5 / 13	0.093 - 0.098	2.90E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		VOCs														
	71-55-6	1,1,1-Trichloroethane	1.70E-01 J	1.90E-01 J	ug/L	TS-3-D (13 - 15 ft)	2 / 21	0.25 - 0.5	1.90E-01	N/A	N/A	N/A	7.42E+02 NC	N	3.11E+03 NC	N
	75-34-3	1,1-Dichloroethane	1.30E-01 J	2.60E-01 J	ug/L	TS-3-D (13 - 15 ft)	2 / 21	0.25 - 0.5	2.60E-01	N/A	N/A	N/A	7.64E+00 C	N	3.34E+01 C	N
	95-63-6	1,2,4-Trimethylbenzene	2.60E-01 J	3.20E+02 J	ug/L	BB-4 (13.7 - 13.7 ft)	3 / 21	0.2 - 0.5	3.20E+02	N/A	N/A	N/A	2.48E+01 NC	Y	1.04E+02 NC	Y
	78-87-5	1,2-Dichloropropane	9.40E-01	9.40E-01	ug/L	TS-3-D (13 - 15 ft)	1 / 21	0.25 - 0.5	9.40E-01	N/A	N/A	N/A	3.62E+00 NC	N	1.52E+01 NC	N
	99-87-6	4-Isopropyltoluene	2.50E+00	1.10E+01 J	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 21	0.2 - 0.5	1.10E+01	N/A	N/A	N/A	8.87E+01 NC	N	3.73E+02 NC	N
	67-64-1	Acetone	1.10E+01	1.10E+01	ug/L	BB-3 (14.46 - 14.46 ft)	1 / 21	2.5 - 5	1.10E+01	N/A	N/A	N/A	2.25E+06 NC	N	9.45E+06 NC	N
	67-66-3	Chloroform	1.30E-01 J	1.90E-01 J	ug/L	TS-3-D (13 - 15 ft)	2 / 21	0.25 - 0.5	1.90E-01	N/A	N/A	N/A	8.14E-01 C	N	3.55E+00 C	N
	156-59-2	cis-1,2-Dichloroethene	7.20E-01 J	8.40E+00	ug/L	OW-3 (9.65 - 9.65 ft)	6 / 21	0.25 - 0.5	8.40E+00	N/A	N/A	N/A	1.95E+01 NC	N	8.21E+01 NC	N
	100-41-4	Ethylbenzene	4.30E+00	4.80E+00 J	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 21	0.2 - 0.5	4.80E+00	N/A	N/A	N/A	3.49E+00 C	Y	1.52E+01 C	N
	98-82-8	Isopropylbenzene	1.10E+01	1.80E+01 J	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 21	0.2 - 0.5	1.80E+01	N/A	N/A	N/A	8.87E+01 NC	N	3.73E+02 NC	N
	104-51-8	n-Butylbenzene	2.45E+00	6.30E+00 J	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 21	0.2 - 0.5	6.30E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	103-65-1	n-Propylbenzene	1.20E+01	2.60E+01 J	ug/L	BB-4 (13.7 - 13.7 ft)	2 / 21	0.25 - 0.5	2.60E+01	N/A	N/A	N/A	2.43E+02 NC	N	1.02E+03 NC	N
	135-98-8	sec-Butylbenzene	8.10E-01 J	8.90E+00 J	ug/L	BB-4 (13.7 - 13.7 ft)	4 / 21	0.2 - 0.5	8.90E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	98-06-6	tert-Butylbenzene	4.80E-01 J	5.00E+00 J	ug/L	BB-4 (13.7 - 13.7 ft)	4 / 21	0.2 - 0.5	5.00E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	127-18-4	Tetrachloroethene	2.20E-01 J	1.80E+00	ug/L	TS-3-D (13 - 15 ft)	5 / 21	0.25 - 0.5	1.80E+00	N/A	N/A	N/A	5.76E+00 NC	N	2.42E+01 NC	N
	108-88-3	Toluene	1.10E-01 J	1.10E-01 J	ug/L	TS-3-C (14 - 15 ft)	1 / 21	0.2 - 0.5	1.10E-01	N/A	N/A	N/A	1.92E+03 NC	N	8.07E+03 NC	N
	Tot-Xylenes	Total Xylenes	4.10E+01	4.10E+01	ug/L	BB-4 (13.7 - 13.7 ft)	1 / 21	0.6 - 1.5	4.10E+01	N/A	N/A	N/A	3.85E+01 NC	Y	1.62E+02 NC	N
	79-01-6	Trichloroethylene	1.40E+00	7.50E+01	ug/L	TS-3-D (13 - 15 ft)	7 / 21	0.25 - 0.5	7.50E+01	N/A	N/A	N/A	5.18E-01 NC	Y	2.18E+00 NC	Y

TABLE 3-2.7
OCCURRENCE, DISTRIBUTION AND SCREENING EVALUATION FOR THE SHALLOW GROUNDWATER TO INDOOR AIR (VAPOR INTRUSION) PATHWAY
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe	Future
Medium:	Groundwater
Exposure Medium:	Shallow Groundwater (Vapor Intrusion to Indoor Air)

Exposure Point	CAS Number	Chemicals	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Background Value (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Residential VISL (NC/C) (5)	Exceed Residential VISL? (Y/N)	Industrial VISL (NC/C) (5)	Exceed Industrial VISL? (Y/N)

Notes:

Refer to Attachment A for analytical data tables and summary of samples.

ARAR/TBC = Applicable or Relevant and Appropriate Requirements/To be Considered.

C = Cancer. Screening value is based on the screening level protective of carcinogenic effects.

CAS = Chemical Abstracts Service.

COPC = Chemical of Potential Concern.

ug/L = Micrograms per liter.

N/A = Not Applicable or Not Available.

NC = Noncancer. Screening value is based on the screening level protective of noncarcinogenic effects.

SVOCs = Semivolatile organic compounds.

USEPA = United States Environmental Protection Agency.

VISL = Vapor Intrusion Screening Level.

VOCs = Volatile organic compounds.

(1) Minimum/maximum detected concentration and associated data flags.

J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.

(2) Lab Reporting Detection Limits (RDLs) are shown where the frequency of detection is less than 100%.

(3) Maximum detected concentration used for screening.

(4) A background dataset is not available for groundwater.

(5) Groundwater screening levels were obtained from the USEPA Vapor Intrusion Screening Level (VISL) calculator (May 2020) for a residential and industrial scenario based on a target risk of 1E-6 for carcinogens and a target hazard of 0.1 for noncarcinogens. Only chemicals detected in shallow groundwater that are indicated as being sufficiently volatile by the USEPA VISL calculator are included.

The following surrogates were used for chemicals without available screening levels or with multiple forms:

The value for elemental mercury was used for mercury.

The value for 1,1-dichloroethene was used for cis-1,2-dichloroethene.

The value for isopropylbenzene (cumene) was used for 4-isopropyltoluene.

TABLE 3-2.8
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SEDIMENT
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Screening Toxicity Value (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N)	Rationale for Selection or Deletion (5)	Background Value (6)	Exceed BTV? (Y/N)
Off-Project		**Inorganics**														
Red Maple	7429-90-5	Aluminum	2.10E+03	2.07E+04	mg/kg	SED-336 (0 - 0.5 ft)	15 / 15	-	2.07E+04	7.70E+03 NC	N/A	N/A	Y	ASL	1.14E+04	Y
Swamp / Tidal	7440-36-0	Antimony	2.10E-02 J	1.10E+00	mg/kg	SED-331 (0 - 0.5 ft)	15 / 15	-	1.10E+00	3.10E+00 NC	N/A	N/A	N	BSL	N/A	N/A
Stream Area	7440-38-2	Arsenic	5.90E-01	2.64E+01	mg/kg	SED-335 (0 - 0.5 ft)	20 / 21	1.7 - 1.7	2.64E+01	6.80E-01 C	N/A	N/A	Y	ASL	7.10E+00	Y
	7440-39-3	Barium	1.50E+00 J	1.20E+02	mg/kg	SED-332 (0 - 0.5 ft)	21 / 21	-	1.20E+02	1.50E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-41-7	Beryllium	2.15E-01	1.65E+00	mg/kg	SED-332 (0 - 0.5 ft)	15 / 15	-	1.65E+00	1.60E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-43-9	Cadmium	1.30E-02 J	2.90E+00	mg/kg	SED-332 (0 - 0.5 ft)	16 / 21	0.3 - 0.6	2.90E+00	7.10E+00 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-70-2	Calcium	3.10E+02	6.67E+03	mg/kg	SED-331 (0 - 0.5 ft)	15 / 15	-	6.67E+03	EN	N/A	N/A	N	NUT	N/A	N/A
	7440-47-3	Chromium	2.30E+00	4.44E+01	mg/kg	SED-335 (0 - 0.5 ft)	21 / 21	-	4.44E+01	1.20E+04 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-48-4	Cobalt	1.01E+00	3.10E+01	mg/kg	SED-332 (0 - 0.5 ft)	15 / 15	-	3.10E+01	2.30E+00 NC	N/A	N/A	Y	ASL	4.42E+00	Y
	7440-50-8	Copper	3.54E+00	7.53E+01	mg/kg	SED-335 (0 - 0.5 ft)	15 / 15	-	7.53E+01	3.10E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	7439-89-6	Iron	4.03E+03	1.23E+05	mg/kg	SED-331 (0 - 0.5 ft)	15 / 15	-	1.23E+05	5.50E+03 NC	N/A	N/A	Y	ASL	1.11E+04	Y
	7439-92-1	Lead	4.60E+00	5.84E+02	mg/kg	SED-335 (0 - 0.5 ft)	21 / 21	-	5.84E+02	4.00E+02 L	N/A	N/A	Y	ASL	7.61E+01	Y
	7439-95-4	Magnesium	8.94E+02	7.44E+03	mg/kg	SED-336 (0 - 0.5 ft)	15 / 15	-	7.44E+03	EN	N/A	N/A	N	NUT	N/A	N/A
	7439-96-5	Manganese	4.32E+01	2.41E+03	mg/kg	SED-332 (0 - 0.5 ft)	15 / 15	-	2.41E+03	1.80E+02 NC	N/A	N/A	Y	ASL	1.93E+02	Y
	7439-97-6	Mercury	1.10E-02 J	2.89E-01	mg/kg	SED-335 (0 - 0.5 ft)	18 / 21	0.021 - 0.035	2.89E-01	2.30E+00 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-02-0	Nickel	2.62E+00	3.32E+01	mg/kg	SED-335 (0 - 0.5 ft)	15 / 15	-	3.32E+01	1.50E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-09-7	Potassium	3.21E+02	2.90E+03	mg/kg	SED-335 (0 - 0.5 ft)	15 / 15	-	2.90E+03	EN	N/A	N/A	N	NUT	N/A	N/A
	7782-49-2	Selenium	5.00E-02 J	6.19E+00	mg/kg	SED-332 (0 - 0.5 ft)	16 / 21	0.2 - 6.8	6.19E+00	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-22-4	Silver	9.00E-03 J	8.37E-01	mg/kg	SED-335 (0 - 0.5 ft)	15 / 21	0.3 - 0.6	8.37E-01	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-23-5	Sodium	3.45E+02 J	2.61E+04	mg/kg	SED-336 (0 - 0.5 ft)	10 / 15	26 - 38	2.61E+04	EN	N/A	N/A	N	NUT	N/A	N/A
	7440-28-0	Thallium	3.20E-02 J	4.50E-01 J	mg/kg	SED-332 (0 - 0.5 ft)	15 / 15	-	4.50E-01	7.80E-02 NC	N/A	N/A	Y	ASL	1.72E-01	Y
	7440-62-2	Vanadium	4.45E+00	7.05E+01	mg/kg	SED-335 (0 - 0.5 ft)	15 / 15	-	7.05E+01	3.90E+01 NC	N/A	N/A	Y	ASL	2.10E+01	Y
	7440-66-6	Zinc	1.90E+01	3.30E+02	mg/kg	SED-332 (0 - 0.5 ft)	15 / 15	-	3.30E+02	2.30E+03 NC	N/A	N/A	N	BSL	N/A	N/A
		PCBs														
	Tot-PCB-ARO	Total PCB Aroclors	8.40E-02	1.50E+00	mg/kg	SED-335 (0 - 0.5 ft)	10 / 18	0.066 - 0.69	1.50E+00	1.20E-01 NC	N/A	N/A	Y	ASL	N/A	N/A

TABLE 3-2.8
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SEDIMENT
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Screening Toxicity Value (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N)	Rationale for Selection or Deletion (5)	Background Value (6)	Exceed BTV? (Y/N)
Off-Project		**SVOCs**														
Red Maple	90-12-0	1-Methylnaphthalene	2.00E-03 J	2.00E-01	mg/kg	SED-334 (0 - 0.5 ft)	13 / 15	0.012 - 0.085	2.00E-01	1.80E+01 C	N/A	N/A	N	BSL	N/A	N/A
Swamp / Tidal	91-57-6	2-Methylnaphthalene	4.40E-03 J	2.40E-01	mg/kg	SED-335 (0 - 0.5 ft)	12 / 15	0.012 - 0.085	2.40E-01	2.40E+01 NC	N/A	N/A	N	BSL	N/A	N/A
Stream Area	83-32-9	Acenaphthene	5.60E-03 J	4.10E-02	mg/kg	SED-338 (0 - 0.5 ft)	7 / 15	0.011 - 0.085	4.10E-02	3.60E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	208-96-8	Acenaphthylene	4.10E-03 J	4.60E-02 J	mg/kg	SED-335 (0 - 0.5 ft)	8 / 15	0.012 - 0.085	4.60E-02	3.60E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	120-12-7	Anthracene	4.70E-03 J	3.50E-01 J	mg/kg	SED-327 (0 - 0.5 ft)	14 / 15	0.011 - 0.011	3.50E-01	1.80E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	56-55-3	Benzo(a)anthracene	2.50E-02	7.90E-01	mg/kg	SED-328; SED-335 (0 - 0.5 ft)	15 / 15	-	7.90E-01	1.10E+00 C	N/A	N/A	N	BSL	N/A	N/A
	50-32-8	Benzo(a)Pyrene	4.80E-02 J	1.70E+00 J	mg/kg	SED-328 (0 - 0.5 ft)	15 / 15	-	1.70E+00	1.10E-01 C	N/A	N/A	Y	ASL	8.33E+00	N
	205-99-2	Benzo(b)fluoranthene	5.80E-02	3.60E+00	mg/kg	SED-328 (0 - 0.5 ft)	15 / 15	-	3.60E+00	1.10E+00 C	N/A	N/A	Y	ASL	1.40E+01	N
	191-24-2	Benzo(g,h,i)Perylene	2.70E-02	2.00E+00	mg/kg	SED-328 (0 - 0.5 ft)	15 / 15	-	2.00E+00	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	207-08-9	Benzo(k)Fluoranthene	1.90E-02 J	1.20E+00	mg/kg	SED-328 (0 - 0.5 ft)	15 / 15	-	1.20E+00	1.10E+01 C	N/A	N/A	N	BSL	N/A	N/A
	117-81-7	Bis-(2-Ethylhexyl)-Phthalate	1.10E-01 J	2.20E+00 J	mg/kg	SED-335 (0 - 0.5 ft)	5 / 15	0.29 - 19	2.20E+00	3.90E+01 C	N/A	N/A	N	BSL	N/A	N/A
	86-74-8	Carbazole	2.20E-01 J	2.20E-01 J	mg/kg	SED-328 (0 - 0.5 ft)	1 / 15	0.27 - 19	2.20E-01	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	218-01-9	Chrysene	5.90E-02	2.20E+00	mg/kg	SED-328 (0 - 0.5 ft)	15 / 15	-	2.20E+00	1.10E+02 C	N/A	N/A	N	BSL	N/A	N/A
	53-70-3	Dibenzo(a,h)Anthracene	8.70E-03 J	3.80E-01	mg/kg	SED-328 (0 - 0.5 ft)	15 / 15	-	3.80E-01	1.10E-01 C	N/A	N/A	Y	ASL	1.21E+00	N
	206-44-0	Fluoranthene	4.80E-02	3.40E+00	mg/kg	SED-328 (0 - 0.5 ft)	15 / 15	-	3.40E+00	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	86-73-7	Fluorene	4.70E-03 J	2.30E-01	mg/kg	SED-335 (0 - 0.5 ft)	12 / 15	0.012 - 0.085	2.30E-01	2.40E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	193-39-5	Indeno(1,2,3-CD)Pyrene	3.10E-02	3.20E+00	mg/kg	SED-328 (0 - 0.5 ft)	15 / 15	-	3.20E+00	1.10E+00 C	N/A	N/A	Y	ASL	7.51E+00	N
	91-20-3	Naphthalene	7.20E-03 J	3.70E-01	mg/kg	SED-335 (0 - 0.5 ft)	10 / 15	0.012 - 0.085	3.70E-01	2.00E+00 C	N/A	N/A	N	BSL	N/A	N/A
	85-01-8	Phenanthrene	7.00E-02	1.90E+00	mg/kg	SED-335 (0 - 0.5 ft)	15 / 15	-	1.90E+00	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	129-00-0	Pyrene	8.60E-02	2.10E+00 J	mg/kg	SED-331; SED-335; SED-328 (0 - 0.5 ft)	15 / 15	-	2.10E+00	1.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A
		VOCs														
	78-93-3	2-Butanone (MEK)	8.30E-03 J	4.22E-02 J	mg/kg	SED-104-2014 (0 - 0.5 ft)	5 / 6	0.0319 - 0.0319	4.22E-02	2.70E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	67-64-1	Acetone	6.10E-02	2.83E-01	mg/kg	SED-104-2014 (0 - 0.5 ft)	4 / 6	0.0319 - 0.0485	2.83E-01	6.10E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	75-15-0	Carbon Disulfide	2.80E-03 J	1.34E-02	mg/kg	SED 4 (0 - 0.5 ft)	3 / 6	0.0032 - 0.005	1.34E-02	7.70E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	98-82-8	Isopropylbenzene	3.00E-03 J	3.00E-03 J	mg/kg	SED 3 (0 - 0.5 ft)	1 / 6	0.0032 - 0.0099	3.00E-03	1.90E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	91-20-3	Naphthalene	1.30E-03 J	1.64E-02	mg/kg	SED-104-2014 (0 - 0.5 ft)	3 / 6	0.005 - 7.6	1.64E-02	2.00E+00 C	N/A	N/A	N	BSL	N/A	N/A
	135-98-8	sec-Butylbenzene	8.75E-03	8.75E-03	mg/kg	SED 3 (0 - 0.5 ft)	1 / 6	0.0032 - 0.0099	8.75E-03	7.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	98-06-6	tert-Butylbenzene	5.20E-03 J	5.20E-03 J	mg/kg	SED 3 (0 - 0.5 ft)	1 / 6	0.0032 - 0.0099	5.20E-03	7.80E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	108-88-3	Toluene	4.00E-03 J	4.00E-03 J	mg/kg	SED 4 (0 - 0.5 ft)	1 / 6	0.0032 - 0.0099	4.00E-03	4.90E+02 NC	N/A	N/A	N	BSL	N/A	N/A

TABLE 3-2.8
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SEDIMENT
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Screening Toxicity Value (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N)	Rationale for Selection or Deletion (5)	Background Value (6)	Exceed BTV? (Y/N)
Off-Project		**Inorganics**														
Narragansett Bay	7429-90-5	Aluminum	1.62E+03	1.06E+04	mg/kg	SED-305 (0 - 1 ft)	10 / 10	-	1.06E+04	7.70E+03 NC	N/A	N/A	Y	ASL	1.02E+04	Y
and Beachfront Area	7440-36-0	Antimony	1.75E-02 J	5.40E-02 J	mg/kg	SED-309 (0 - 1 ft)	9 / 10	0.042 - 0.042	5.40E-02	3.10E+00 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-38-2	Arsenic	9.30E-01	3.20E+00 J	mg/kg	Beach-5-A (0 - 0.5 ft)	30 / 30	-	3.20E+00	6.80E-01 C	N/A	N/A	Y	ASL	2.31E+00	Y
	7440-39-3	Barium	1.80E+00 J	8.00E+00 J	mg/kg	Beach-8-A (0 - 0.5 ft)	21 / 30	2.3 - 2.5	8.00E+00	1.50E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-41-7	Beryllium	1.80E-01	1.58E+00	mg/kg	SED-304 (0 - 1 ft)	10 / 10	-	1.58E+00	1.60E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-43-9	Cadmium	1.40E-02 J	9.09E-02	mg/kg	SED-305 (0 - 1 ft)	10 / 30	0.18 - 0.5	9.09E-02	7.10E+00 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-70-2	Calcium	2.25E+02	5.18E+02 J	mg/kg	SED-305 (0 - 1 ft)	10 / 10	-	5.18E+02	EN	N/A	N/A	N	NUT	N/A	N/A
	7440-47-3	Chromium	1.90E+00 J	1.82E+01	mg/kg	SED-OFF-9-090115 (0 - 0.5 ft)	30 / 30	-	1.82E+01	1.20E+04 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-48-4	Cobalt	1.02E+00	3.92E+00	mg/kg	SED-305 (0 - 1 ft)	10 / 10	-	3.92E+00	2.30E+00 NC	N/A	N/A	Y	ASL	8.45E+00	N
	7440-50-8	Copper	2.49E+00	1.41E+01	mg/kg	SED-304 (0 - 1 ft)	10 / 10	-	1.41E+01	3.10E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	7439-89-6	Iron	3.96E+03	1.72E+04 J	mg/kg	SED-305 (0 - 1 ft)	10 / 10	-	1.72E+04	5.50E+03 NC	N/A	N/A	Y	ASL	1.98E+04	N
	7439-92-1	Lead	2.70E+00 J	2.08E+01	mg/kg	SED-303 (0 - 1 ft)	30 / 30	-	2.08E+01	4.00E+02 L	N/A	N/A	N	BSL	N/A	N/A
	7439-95-4	Magnesium	6.36E+02	4.39E+03	mg/kg	SED-305 (0 - 1 ft)	10 / 10	-	4.39E+03	EN	N/A	N/A	N	NUT	N/A	N/A
	7439-96-5	Manganese	4.66E+01	2.33E+02 J	mg/kg	SED-305 (0 - 1 ft)	10 / 10	-	2.33E+02	1.80E+02 NC	N/A	N/A	Y	ASL	2.55E+02	N
	7439-97-6	Mercury	5.30E-03 J	5.80E-03 J	mg/kg	SED-302 (0 - 1 ft)	2 / 30	0.011 - 0.03	5.80E-03	2.30E+00 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-02-0	Nickel	2.61E+00	8.10E+00 J	mg/kg	SED-305 (0 - 1 ft)	10 / 10	-	8.10E+00	1.50E+02 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-09-7	Potassium	2.80E+02	5.91E+02 J	mg/kg	SED-301 (0 - 1 ft)	10 / 10	-	5.91E+02	EN	N/A	N/A	N	NUT	N/A	N/A
	7782-49-2	Selenium	3.20E-02 J	5.90E-02 J	mg/kg	SED-305 (0 - 1 ft)	3 / 30	0.19 - 6	5.90E-02	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-22-4	Silver	7.30E-03 J	1.40E-02 J	mg/kg	SED-307 (0 - 1 ft)	10 / 30	0.23 - 0.5	1.40E-02	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-23-5	Sodium	8.18E+02	1.34E+03	mg/kg	SED-308 (0 - 1 ft)	10 / 10	-	1.34E+03	EN	N/A	N/A	N	NUT	N/A	N/A
	7440-28-0	Thallium	2.20E-02 J	3.50E-02 J	mg/kg	SED-301; SED-303 (0 - 1 ft)	10 / 10	-	3.50E-02	7.80E-02 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-62-2	Vanadium	3.00E+00	1.03E+01 J	mg/kg	SED-305 (0 - 1 ft)	10 / 10	-	1.03E+01	3.90E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	7440-66-6	Zinc	1.72E+01	6.40E+01	mg/kg	SED-304 (0 - 1 ft)	10 / 10	-	6.40E+01	2.30E+03 NC	N/A	N/A	N	BSL	N/A	N/A
		PCBs							0.00E+00							
	Tot-PCB-ARO	Total PCB Aroclors	7.00E-02	8.30E-02	mg/kg	SED-310 (0 - 1 ft)	10 / 10	-	8.30E-02	1.20E-01 NC	N/A	N/A	N	BSL	N/A	N/A
		VOCs							0.00E+00							
	67-64-1	Acetone	7.40E-03	1.53E-02	mg/kg	SED-OFF-6-083115 (0 - 0.5 ft)	8 / 20	0.0025 - 0.0068	1.53E-02	6.10E+03 NC	N/A	N/A	N	BSL	N/A	N/A
	74-83-9	Bromomethane	1.20E-03 J	1.50E-03 J	mg/kg	Beach-6-A (0 - 0.5 ft)	2 / 20	0.0005 - 0.0027	1.50E-03	6.80E-01 NC	N/A	N/A	N	BSL	N/A	N/A
	75-15-0	Carbon Disulfide	8.30E-04 J	1.14E-02	mg/kg	SED-OFF-1-083115 (0 - 0.5 ft)	11 / 20	0.00058 - 0.0027	1.14E-02	7.70E+01 NC	N/A	N/A	N	BSL	N/A	N/A
	156-59-2	cis-1,2-Dichloroethene	2.90E-04 J	2.90E-04 J	mg/kg	SED-OFF-5-083115 (0 - 0.5 ft)	1 / 20	0.00025 - 0.0027	2.90E-04	1.60E+01 NC	N/A	N/A	N	BSL	N/A	N/A

TABLE 3-2.8
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SEDIMENT
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Screening Toxicity Value (NC/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N)	Rationale for Selection or Deletion (5)	Background Value (6)	Exceed BTV? (Y/N)

Notes:

Refer to Attachment A for analytical data tables and summary of samples within each area.

ARAR/TBC = Applicable or Relevant and Appropriate Requirements/To be Considered.

BTV = Background Threshold Value.

C = Cancer. Screening value is based on the screening level protective of carcinogenic effects.

CAS = Chemical Abstracts Service.

COPC = Chemical of Potential Concern.

EN = Essential Nutrient.

L = Lead screening levels developed by USEPA using blood-lead modeling based on target blood lead concentration of 5 micrograms per deciliter (ug/dL). Soil screening level was conservatively used for sediment.

mg/kg = Milligrams per kilogram.

N/A = Not Applicable or Not Available.

NC = Noncancer. Screening value is based on the screening level protective of noncarcinogenic effects.

PCBs = Polychlorinated biphenyls.

SVOCs = Semivolatile organic compounds.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) Minimum/maximum detected concentration and associated data flags.

J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.

(2) Lab Reporting Detection Limits (RDLs) are shown where the frequency of detection is less than 100%.

(3) Maximum detected concentration used for screening.

(4) Screening levels are equal to the USEPA Regional Screening Level (RSL) for residential soil based on a target risk level of 1E-6 for carcinogens and a target hazard quotient of 0.1 for noncarcinogens (May 2020).

The following surrogates were used for chemicals without available screening levels or with multiple forms:

The value for cadmium in the diet was used for cadmium.

The value for trivalent chromium was used for chromium.

The value for manganese non-diet was used for manganese.

The value for mercuric chloride was used for mercury.

The value for Aroclor-1254 was used for total PCBs.

The value for acenaphthene was used for acenaphthylene.

The value for fluorene was used for carbazole.

The value for pyrene was used for benzo(g,h,i)perylene and phenanthrene.

(5) Rationale Codes:

Selection Reason: Above Screening Level (ASL)

Deletion Reason: Below Screening Level (BSL); Essential Nutrient (NUT)

(6) Equal to the Background Threshold Value (BTV) calculated for chemicals identified as preliminary COPCs within the associated medium and exposure point (area), as described in the report text.

TABLE 3-2.9
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SURFACE WATER
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Surface Water

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Background Value (4)	Screening Toxicity Value (NC/C) (5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Preliminary COPC Flag (Y/N)	Rationale for Selection or Deletion (6)
Off-Project		**Inorganics**													
Red Maple	7440-39-3	Barium	4.20E+00 J	1.35E+01 J	ug/L	SW-104-2014 (0.2 - 0.2 ft)	7 / 7	-	1.35E+01	N/A	3.80E+02 NC	1.00E+03	AWQC	N	BSL
Swamp / Tidal	7440-43-9	Cadmium	3.00E-02 J	6.00E-02 J	ug/L	SW-3A (0.5 - 0.5 ft)	3 / 7	0.1 - 0.12	6.00E-02	N/A	9.20E-01 NC	N/A	N/A	N	BSL
Stream Area	7440-47-3	Chromium	2.40E+00 J	2.40E+00 J	ug/L	SW-105-2014 (0.7 - 0.7 ft)	1 / 7	3 - 10	2.40E+00	N/A	2.20E+03 NC	N/A	N/A	N	BSL
	7439-92-1	Lead	6.00E-01 J	1.60E+00 J	ug/L	SW-1A (0.25 - 0.25 ft)	2 / 7	1 - 2.5	1.60E+00	N/A	1.50E+01	N/A	N/A	N	BSL
	7440-22-4	Silver	1.00E-01 J	1.00E-01 J	ug/L	SW-103-2014 (0.5 - 0.5 ft)	1 / 7	0.1 - 0.25	1.00E-01	N/A	9.40E+00 NC	N/A	N/A	N	BSL
		VOCs													
	87-61-6	1,2,3-Trichlorobenzene	1.20E-01 J	1.20E-01 J	ug/L	SW-105-2014 (0.7 - 0.7 ft)	1 / 10	0.25 - 1	1.20E-01	N/A	7.00E-01 NC	7.10E-02	AWQC (7)	Y	ASL
	67-64-1	Acetone	4.40E+00 J	4.40E+00 J	ug/L	SW-105-2014 (0.7 - 0.7 ft)	1 / 10	5 - 10	4.40E+00	N/A	1.40E+03 NC	N/A	N/A	N	BSL
	75-15-0	Carbon Disulfide	2.60E+00	2.60E+00	ug/L	SW-105-2014 (0.7 - 0.7 ft)	1 / 10	0.2 - 1	2.60E+00	N/A	8.10E+01 NC	N/A	N/A	N	BSL
	91-20-3	Naphthalene	1.80E-01 J	1.80E-01 J	ug/L	SW-105-2014 (0.7 - 0.7 ft)	1 / 10	0.25 - 1	1.80E-01	N/A	1.20E-01 C	N/A	N/A	Y	ASL

Notes:

Refer to Attachment A for analytical data tables and summary of samples within each area.

ARAR/TBC = Applicable or Relevant and Appropriate Requirements/To be Considered.

AWQC = USEPA National Recommended Ambient Water Quality Criteria (https://www.epa.gov/wqc/national-recommended-water-quality-criteria-human-health-criteria-table, accessed September 2020). Value for Human Health for the consumption of water and organisms.

C = Cancer. Screening value is based on the screening level protective of carcinogenic effects.

CAS = Chemical Abstracts Service.

COPC = Chemical of Potential Concern.

ug/L = Micrograms per liter.

N/A = Not Applicable or Not Available.

NC = Noncancer. Screening value is based on the screening level protective of noncarcinogenic effects.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) Minimum/maximum detected concentration and associated data flags.

J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.

(2) Lab Reporting Detection Limits (RDLs) are shown where the frequency of detection is less than 100%.

(3) Maximum detected concentration used for screening.

(4) A background dataset is not available for surface water.

(5) Screening levels are equal to the USEPA Regional Screening Level for Tapwater. May 2020. Values based on a target risk level of 1E-6 and a target hazard quotient of 0.1 to account for cumulative effects on the same target organ.

The following surrogates were used for chemicals without available screening levels or with multiple forms:

The value for cadmium in water was used for cadmium.

The value for trivalent chromium was used for chromium.

Value for lead is the Safe Drinking Water Act (SDWA) action level, as presented on the USEPA Maximum Contaminant Level (MCL) Table (https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations, accessed September 2020).

(6) Rationale Codes:

Selection Reason: Above Screening Level (ASL)

Deletion Reason: Below Screening Level (BSL); Essential Nutrient (NUT)

(7) Value for 1,2,4-trichlorobenzene used as a surrogate for 1,2,3-trichlorobenzene.

TABLE 3-2.10
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SOIL VAPOF
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe Future
Medium: Soil Vapor
Exposure Medium: Soil Vapor

Exposure Point	CAS Number	Chemicals	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Background Value (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Residential VISL (NC/C) (5)	Preliminary COPC Flag (Y/N)	Rationale for Selection or Deletion (6)	Industrial VISL (NC/C) (5)	Exceed Industrial VISL? (Y/N) (7)
On-Project		**VOCs**															
Blue Beach Area	75-34-3	1,1-Dichloroethane	2.80E+00	2.80E+00	ug/m^3	EA01VP (8 - 12 ft)	1 / 6	1.2 - 12	2.80E+00	N/A	N/A	N/A	5.85E+01 C	N	BSL	2.56E+02 C	N
	95-63-6	1,2,4-Trimethylbenzene	3.60E+00	3.60E+00	ug/m^3	EA01VP (8 - 12 ft)	1 / 6	1.5 - 15	3.60E+00	N/A	N/A	N/A	2.09E+02 NC	N	BSL	8.76E+02 NC	N
	78-93-3	2-Butanone (MEK)	3.70E+00	2.20E+01	ug/m^3	EA27VP (8 - 12 ft)	3 / 6	8.8 - 8.8	2.20E+01	N/A	N/A	N/A	1.74E+04 NC	N	BSL	7.30E+04 NC	N
	622-96-8	4-Ethyl Toluene	2.10E+00	2.10E+00	ug/m^3	EA01VP (8 - 12 ft)	1 / 6	1.5 - 15	2.10E+00	N/A	N/A	N/A	1.74E+04 NC	N	BSL	7.30E+04 NC	N
	108-10-1	4-Methyl-2-pentanone	3.80E+00	3.80E+00	ug/m^3	EA01VP (8 - 12 ft)	1 / 6	1.2 - 12	3.80E+00	N/A	N/A	N/A	1.04E+04 NC	N	BSL	4.38E+04 NC	N
	67-64-1	Acetone	1.60E+01	1.60E+01	ug/m^3	EA01VP (8 - 12 ft)	1 / 6	0.7 - 7.2	1.60E+01	N/A	N/A	N/A	1.07E+05 NC	N	BSL	4.51E+05 NC	N
	71-43-2	Benzene	1.60E+02	1.60E+02	ug/m^3	EA26VP (8 - 12 ft)	1 / 6	1 - 9.6	1.60E+02	N/A	N/A	N/A	1.20E+01 C	Y	ASL	5.24E+01 C	Y
	74-87-3	Chloromethane	1.20E+00	1.20E+00	ug/m^3	EA01VP (8 - 12 ft)	1 / 6	0.7 - 7.4	1.20E+00	N/A	N/A	N/A	3.13E+02 NC	N	BSL	1.31E+03 NC	N
	156-59-2	cis-1,2-Dichloroethene	5.10E+01	5.10E+01	ug/m^3	EA27VP (8 - 12 ft)	1 / 6	1.2 - 12	5.10E+01	N/A	N/A	N/A	6.95E+02 NC	N	BSL	2.92E+03 NC	N
	110-82-7	Cyclohexane	2.00E+01	4.30E+02	ug/m^3	EA20VP (8 - 12 ft)	3 / 6	1 - 10	4.30E+02	N/A	N/A	N/A	2.09E+04 NC	N	BSL	8.76E+04 NC	N
	75-71-8	Dichlorodifluoromethane	2.50E+00	2.50E+00	ug/m^3	EA04VP (8 - 12 ft)	1 / 6	1.5 - 15	2.50E+00	N/A	N/A	N/A	3.48E+02 NC	N	BSL	1.46E+03 NC	N
	64-17-5	Ethanol	1.00E+00	1.40E+01	ug/m^3	EA27VP (8 - 12 ft)	3 / 6	5.6 - 5.6	1.40E+01	N/A	N/A	N/A	N/A	N/A	NSL	N/A	N/A
	110-54-3	Hexane	4.90E+02	4.90E+02	ug/m^3	EA20VP (8 - 12 ft)	1 / 6	1.1 - 11	4.90E+02	N/A	N/A	N/A	2.43E+03 NC	N	BSL	1.02E+04 NC	N
	67-63-0	Isopropanol	2.40E+00	2.40E+00	ug/m^3	EA04VP (8 - 12 ft)	1 / 6	0.7 - 7.4	2.40E+00	N/A	N/A	N/A	6.95E+02 NC	N	BSL	2.92E+03 NC	N
	75-09-2	Methylene Chloride	2.70E+00	2.70E+00	ug/m^3	EA04VP (8 - 12 ft)	1 / 6	1.9 - 19	2.70E+00	N/A	N/A	N/A	2.09E+03 NC	N	BSL	8.76E+03 NC	N
	1634-04-4	Methyl-t-butyl ether (MTBE)	1.70E+00	1.00E+01	ug/m^3	EA01VP (8 - 12 ft)	2 / 6	11 - 11	1.00E+01	N/A	N/A	N/A	3.60E+02 C	N	BSL	1.57E+03 C	N
	142-82-5	n-Heptane	1.40E+03	1.40E+03	ug/m^3	EA20VP (8 - 12 ft)	1 / 6	1.2 - 12	1.40E+03	N/A	N/A	N/A	1.39E+03 NC	Y	ASL	5.84E+03 NC	N
	127-18-4	Tetrachloroethene	3.70E+00	6.20E+00	ug/m^3	EA04VP (8 - 12 ft)	2 / 6	20 - 20	6.20E+00	N/A	N/A	N/A	1.39E+02 NC	N	BSL	5.84E+02 NC	N
	156-60-5	trans-1,2-Dichloroethene	1.80E+01	1.80E+01	ug/m^3	EA27VP (8 - 12 ft)	1 / 6	1.2 - 12	1.80E+01	N/A	N/A	N/A	6.95E+02 NC	N	BSL	2.92E+03 NC	N
	75-69-4	Trichlorofluoromethane	5.60E+00	5.60E+00	ug/m^3	EA01VP (8 - 12 ft)	1 / 6	1.8 - 18	5.60E+00	N/A	N/A	N/A	N/A	N/A	NSL	N/A	N/A
	108-05-4	Vinyl Acetate	2.50E+00	2.50E+00	ug/m^3	EA04VP (8 - 12 ft)	1 / 6	1.1 - 11	2.50E+00	N/A	N/A	N/A	6.95E+02 NC	N	BSL	2.92E+03 NC	N
	75-01-4	Vinyl Chloride	1.80E+02	1.80E+02	ug/m^3	EA27VP (8 - 12 ft)	1 / 6	0.8 - 7.6	1.80E+02	N/A	N/A	N/A	5.59E+00 C	Y	ASL	9.29E+01 C	Y

TABLE 3-2.10
OCCURRENCE, DISTRIBUTION AND SELECTION OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN - SOIL VAPOF
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe Future
Medium: Soil Vapor
Exposure Medium: Soil Vapor

Exposure Point	CAS Number	Chemicals	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (2)	Concentration Used for Screening (3)	Background Value (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Residential VISL (NC/C) (5)	Preliminary COPC Flag (Y/N)	Rationale for Selection or Deletion (6)	Industrial VISL (NC/C) (5)	Exceed Industrial VISL? (Y/N) (7)

Notes:

Refer to Attachment A for analytical data tables and summary of samples.

ARAR/TBC = Applicable or Relevant and Appropriate Requirements/To be Considered.

C = Cancer. Screening value is based on the screening level protective of carcinogenic effects.

CAS = Chemical Abstracts Service.

COPC = Chemical of Potential Concern.

ug/m^3 = Micrograms per cubic meter.

N/A = Not Applicable or Not Available.

NC = Noncancer. Screening value is based on the screening level protective of noncarcinogenic effects.

USEPA = United States Environmental Protection Agency.

VISL = Vapor Intrusion Screening Level.

VOCs = Volatile organic compounds.

(1) Minimum/maximum detected concentration and associated data flags.

(2) Lab Reporting Detection Limits (RDLs) are shown where the frequency of detection is less than 100%.

(3) Maximum detected concentration used for screening.

(4) A background dataset is not available for soil vapor.

(5) Soil vapor screening levels were obtained from the USEPA Vapor Intrusion Screening Level (VISL) calculator (May 2020) for a residential scenario based on a target risk of 1E-6 for carcinogens and a target hazard of 0.1 for noncarcinogens.

The following surrogates were used for chemicals without available screening levels or with multiple forms:

The value for toluene was used for 4-ethyl toluene.

The value for 1,1-dichloroethene was used for cis-1,2-dichloroethene and trans-1,2-dichloroethene.

(6) Rationale Codes:

Selection Reason: Above Screening Level (ASL)

Deletion Reason: Below Screening Level (BSL); No Available Screening Level (NSL)

(7) A comparison to the USEPA VISLs for an industrial scenario (based on a target risk level of 1E-6 and target hazard quotient of 0.1) (May 2020) is also provided for informational purposes. Surrogates for chemicals without available industrial soil RSLs are consistent with those described in footnote (5). Industrial VISLs are not utilized for COPC selection..

TABLE 3-2.11
SELECTION OF CHEMICALS OF POTENTIAL CONCERN
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Exposure Media	Exposure Point	CAS Number	Preliminary COPCs (1)	Background Evaluation Results (2)			Final Site-Related COPC? (4)
				BTV Comparison (3)	Hypothesis Test	Geochemical Analysis	
Surface Soil (0 - 1 feet)	On-Project		**Inorganics**				
	Blue Beach Area	7429-90-5	Aluminum	Max < BTV - NCOPC	--	--	N
		7440-36-0	Antimony	Max > BTV	Site > Background	Not consistent with Background	Y
		7440-38-2	Arsenic	Max < BTV - NCOPC	--	--	N
		7440-43-9	Cadmium	Max > BTV	Site > Background	Not consistent with Background	Y
		7440-48-4	Cobalt	Max > BTV	Site <= Background - NCOPC	--	N
		7439-89-6	Iron	Max < BTV - NCOPC	--	--	N
		7439-96-5	Manganese	Max > BTV	Site <= Background - NCOPC	--	N
		7440-28-0	Thallium	Max < BTV - NCOPC	--	--	N
			PCBs				
		Tot-PCB-ARO	Total PCB Aroclors	--	--	--	Y
			SVOCs				
		50-32-8	Benzo(a)Pyrene	Max > BTV	Site <= Background - NCOPC	--	N
		53-70-3	Dibenzo(a,h)Anthracene	Max > BTV	Site > Background	--	Y
	Off-Project		**Inorganics**				
	Red Maple	7440-38-2	Arsenic	Max < BTV - NCOPC	--	--	N
	Swamp / Tidal	7440-48-4	Cobalt	Max < BTV - NCOPC	--	--	N
	Stream Area	7439-89-6	Iron	Max < BTV - NCOPC	--	--	N
		7439-96-5	Manganese	Max < BTV - NCOPC	--	--	N
		7440-28-0	Thallium	Max < BTV - NCOPC	--	--	N
			PCBs				
		Tot-PCB-ARO	Total PCB Aroclors	--	--	--	Y
			SVOCs				
		56-55-3	Benzo(a)anthracene	Max > BTV	Site <= Background - NCOPC	--	N
		50-32-8	Benzo(a)Pyrene	Max > BTV	Site <= Background - NCOPC	--	N
		205-99-2	Benzo(b)fluoranthene	Max > BTV	Site <= Background - NCOPC	--	N
		53-70-3	Dibenzo(a,h)Anthracene	Max > BTV	Site <= Background - NCOPC	--	N
		193-39-5	Indeno(1,2,3-CD)Pyrene	Max > BTV	Site <= Background - NCOPC	--	N

TABLE 3-2.11
SELECTION OF CHEMICALS OF POTENTIAL CONCERN
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Exposure Media	Exposure Point	CAS Number	Preliminary COPCs (1)	Background Evaluation Results (2)			Final Site-Related COPC? (4)
				BTV Comparison (3)	Hypothesis Test	Geochemical Analysis	
Subsurface Soil (1 - 15 feet) *	On-Project Blue Beach Area		**Inorganics**				
		7429-90-5	Aluminum	Max < BTV - NCOPC	--	--	N
		7440-36-0	Antimony	Max > BTV	Site > Background	Not consistent with Background	Y
		7440-38-2	Arsenic	Max > BTV	Site <= Background - NCOPC	--	N
		7440-43-9	Cadmium	Max > BTV	Site > Background	Not consistent with Background	Y
		7440-48-4	Cobalt	Max < BTV - NCOPC	--	--	N
		7440-50-8	Copper	Max > BTV	Site <= Background - NCOPC	--	N
		7439-89-6	Iron	Max < BTV - NCOPC	--	--	N
		7439-92-1	Lead	Max > BTV	Site <= Background - NCOPC	--	N
		7439-96-5	Manganese	Max > BTV	Site <= Background - NCOPC	--	N
		7440-28-0	Thallium	Max < BTV - NCOPC	--	--	N
			PCBs				
		Tot-PCB-ARO	Total PCB Aroclors	--	--	--	Y
			SVOCs				
		50-32-8	Benzo(a)Pyrene	Max < BTV - NCOPC	--	--	N
			VOCs				
		95-63-6	1,2,4-Trimethylbenzene	--	--	--	Y
		100-41-4	Ethylbenzene	--	--	--	Y
		Tot-Xylenes	Total Xylenes	--	--	--	Y
		79-01-6	Trichloroethylene	--	--	--	Y
	Off-Project Red Maple Swamp / Tidal Stream Area		**Inorganics**				
		7440-38-2	Arsenic	Max > BTV	Site > Background	Not consistent with Background	Y
			SVOCs				
		50-32-8	Benzo(a)Pyrene	Max > BTV	N/A (6)	--	Y
		91-20-3	Naphthalene	Max > BTV	Site > Background	--	Y
			VOCs				
		100-41-4	Ethylbenzene	--	--	--	Y
		91-20-3	Naphthalene	N/A (5)	--	--	Y

TABLE 3-2.11
SELECTION OF CHEMICALS OF POTENTIAL CONCERN
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Exposure Media	Exposure Point	CAS Number	Preliminary COPCs (1)	Background Evaluation Results (2)			Final Site-Related COPC? (4)
				BTV Comparison (3)	Hypothesis Test	Geochemical Analysis	
Surface Hydric Soil (0 - 1 feet)	Off-Project		**Inorganics**				
	Red Maple	7429-90-5	Aluminum	Max > BTV	Site > Background	Consistent with Background - NCOPC	N
	Swamp / Tidal	7440-38-2	Arsenic	Max > BTV	Site > Background	Not consistent with Background	Y
	Stream Area	7440-48-4	Cobalt	Max > BTV	Site > Background	Consistent with Background - NCOPC	N
		7439-89-6	Iron	Max > BTV	Site > Background	Consistent with Background - NCOPC	N
		7439-96-5	Manganese	Max > BTV	Site > Background	Consistent with Background - NCOPC	N
		7440-28-0	Thallium	N/A (5)	--	--	Y
		7440-62-2	Vanadium	Max > BTV	Site > Background	Consistent with Background - NCOPC	N
			PCBs				
		Tot-PCB-ARO	Total PCB Aroclors	N/A (5)	--	--	Y
			SVOCs				
		56-55-3	Benzo(a)anthracene	Max > BTV	Site <= Background - NCOPC	--	N
		50-32-8	Benzo(a)Pyrene	Max > BTV	Site > Background	--	Y
		205-99-2	Benzo(b)fluoranthene	Max > BTV	Site > Background	--	Y
		53-70-3	Dibenzo(a,h)Anthracene	Max > BTV	Site > Background	--	Y
		193-39-5	Indeno(1,2,3-CD)Pyrene	Max > BTV	Site > Background	--	Y
Subsurface Hydric Soil (1 - 2 feet)	Off-Project		**Inorganics**				
	Red Maple	7429-90-5	Aluminum	Max < BTV - NCOPC	--	--	N
	Swamp / Tidal	7440-38-2	Arsenic	Max > BTV	Site > Background	Consistent with Background - NCOPC	N
	Stream Area	7440-48-4	Cobalt	Max > BTV	Site > Background	Consistent with Background - NCOPC	N
		7439-89-6	Iron	Max > BTV	Site > Background	Consistent with Background - NCOPC	N
		7440-28-0	Thallium	N/A (5)	--	--	Y
		7440-62-2	Vanadium	Max > BTV	Site > Background	Consistent with Background - NCOPC	N
			PCBs				
		Tot-PCB-ARO	Total PCB Aroclors	N/A (5)	--	--	Y

TABLE 3-2.11
SELECTION OF CHEMICALS OF POTENTIAL CONCERN
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Exposure Media	Exposure Point	CAS Number	Preliminary COPCs (1)	Background Evaluation Results (2)			Final Site-Related COPC? (4)
				BTV Comparison (3)	Hypothesis Test	Geochemical Analysis	
Groundwater	On-Project		**Inorganics**				
	Blue Beach Area	7440-36-0	Antimony	--	--	--	Y
		7440-38-2	Arsenic	--	--	--	Y
		7440-39-3	Barium	--	--	--	Y
		7440-43-9	Cadmium	--	--	--	Y
		7440-47-3	Chromium	--	--	--	Y
		7440-48-4	Cobalt	--	--	--	Y
		7439-89-6	Iron	--	--	--	Y
		7439-92-1	Lead	--	--	--	Y
		7439-96-5	Manganese	--	--	--	Y
			SVOCs				
		90-12-0	1-Methylnaphthalene	--	--	--	Y
		91-57-6	2-Methylnaphthalene	--	--	--	Y
		56-55-3	Benzo(a)anthracene	--	--	--	Y
		50-32-8	Benzo(a)Pyrene	--	--	--	Y
		205-99-2	Benzo(b)fluoranthene	--	--	--	Y
		91-20-3	Naphthalene	--	--	--	Y
			VOCs				
		79-34-5	1,1,2,2-Tetrachloroethane	--	--	--	Y
		79-00-5	1,1,2-Trichloroethane	--	--	--	Y
		75-34-3	1,1-Dichloroethane	--	--	--	Y
		95-63-6	1,2,4-Trimethylbenzene	--	--	--	Y
		78-87-5	1,2-Dichloropropane	--	--	--	Y
		67-66-3	Chloroform	--	--	--	Y
		156-59-2	cis-1,2-Dichloroethene	--	--	--	Y
		100-41-4	Ethylbenzene	--	--	--	Y
		91-20-3	Naphthalene	--	--	--	Y
		127-18-4	Tetrachloroethene	--	--	--	Y
		Tot-Xylenes	Total Xylenes	--	--	--	Y
		79-01-6	Trichloroethylene	--	--	--	Y
		75-01-4	Vinyl Chloride	--	--	--	Y

TABLE 3-2.11
SELECTION OF CHEMICALS OF POTENTIAL CONCERN
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Exposure Media	Exposure Point	CAS Number	Preliminary COPCs (1)	Background Evaluation Results (2)			Final Site-Related COPC? (4)
				BTV Comparison (3)	Hypothesis Test	Geochemical Analysis	
Shallow Groundwater	On-Project Blue Beach Area		**Inorganics**				
		7440-36-0	Antimony	--	--	--	Y
		7440-38-2	Arsenic	--	--	--	Y
		7440-43-9	Cadmium	--	--	--	Y
		7440-48-4	Cobalt	--	--	--	Y
		7439-89-6	Iron	--	--	--	Y
		7439-96-5	Manganese	--	--	--	Y
			SVOCs				
		90-12-0	1-Methylnaphthalene	--	--	--	Y
		91-57-6	2-Methylnaphthalene	--	--	--	Y
		56-55-3	Benzo(a)anthracene	--	--	--	Y
		50-32-8	Benzo(a)Pyrene	--	--	--	Y
		205-99-2	Benzo(b)fluoranthene	--	--	--	Y
		91-20-3	Naphthalene	--	--	--	Y
			VOCs				
		95-63-6	1,2,4-Trimethylbenzene	--	--	--	Y
		78-87-5	1,2-Dichloropropane	--	--	--	Y
		156-59-2	cis-1,2-Dichloroethene	--	--	--	Y
		100-41-4	Ethylbenzene	--	--	--	Y
		Tot-Xylenes	Total Xylenes	--	--	--	Y
		79-01-6	Trichloroethylene	--	--	--	Y

TABLE 3-2.11
SELECTION OF CHEMICALS OF POTENTIAL CONCERN
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Exposure Media	Exposure Point	CAS Number	Preliminary COPCs (1)	Background Evaluation Results (2)			Final Site-Related COPC? (4)
				BTV Comparison (3)	Hypothesis Test	Geochemical Analysis	
Sediment	Off-Project		**Inorganics**				
	Red Maple	7429-90-5	Aluminum	Max > BTV	Site <= Background - NCOPC	--	N
	Swamp / Tidal	7440-38-2	Arsenic	Max > BTV	Site <= Background - NCOPC	--	N
	Stream Area	7440-48-4	Cobalt	Max > BTV	Site <= Background - NCOPC	--	N
		7439-89-6	Iron	Max > BTV	Site <= Background - NCOPC	--	N
		7439-92-1	Lead	Max > BTV	Site <= Background - NCOPC	--	N
		7439-96-5	Manganese	Max > BTV	Site <= Background - NCOPC	--	N
		7440-28-0	Thallium	Max > BTV	Site <= Background - NCOPC	--	N
		7440-62-2	Vanadium	Max > BTV	Site <= Background - NCOPC	--	N
			PCBs				
		Tot-PCB-ARO	Total PCB Aroclors	N/A (5)	--	--	Y
			SVOCs				
		50-32-8	Benzo(a)Pyrene	Max < BTV - NCOPC	--	--	N
		205-99-2	Benzo(b)fluoranthene	Max < BTV - NCOPC	--	--	N
		53-70-3	Dibenzo(a,h)Anthracene	Max < BTV - NCOPC	--	--	N
		193-39-5	Indeno(1,2,3-CD)Pyrene	Max < BTV - NCOPC	--	--	N
	Off-Project Narragansett Bay and Beachfront Area		**Inorganics**				
		7429-90-5	Aluminum	Max > BTV	Site <= Background - NCOPC	--	N
		7440-38-2	Arsenic	Max > BTV	Site <= Background - NCOPC	--	N
		7440-48-4	Cobalt	Max < BTV - NCOPC	--	--	N
		7439-89-6	Iron	Max < BTV - NCOPC	--	--	N
		7439-96-5	Manganese	Max < BTV - NCOPC	--	--	N
Surface Water	Off-Project		**VOCs**				
	Red Maple	87-61-6	1,2,3-Trichlorobenzene	--	--	--	Y
	Swamp / Tidal	91-20-3	Naphthalene	--	--	--	Y
	Stream Area						
Soil Vapor	On-Project		**VOCs**				
	Blue Beach Area	71-43-2	Benzene	--	--	--	Y
		142-82-5	n-Heptane	--	--	--	Y
		75-01-4	Vinyl Chloride	--	--	--	Y

TABLE 3-2.11
SELECTION OF CHEMICALS OF POTENTIAL CONCERN
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Exposure Media	Exposure Point	CAS Number	Preliminary COPCs (1)	Background Evaluation Results (2)			Final Site-Related COPC? (4)
				BTV Comparison (3)	Hypothesis Test	Geochemical Analysis	

Notes:

-- = Associated background evaluation step not performed because a background dataset is not available for the associated media/analyte, because the associated COPC was eliminated in a previous tier of background evaluation, or because the associated test (i.e., geochemical analysis) is not available for the analyte (i.e., non-metals).

BTV = Background Threshold Value.

CAS = Chemical Abstracts Service.

COPC = Chemical of Potential Concern.

N = No.

N/A = Not Available/Applicable.

NCOPC = Chemical identified as being present at concentrations less than or consistent with background, and is therefore, considered not to be a site-related COPC.

PCBs = Polychlorinated biphenyls.

SVOCs = Semivolatile organic compounds.

VOCs = Volatile organic compounds.

Y = Yes.

(1) Preliminary COPCs selected based on comparison to human health screening levels (performed in Tables 2.1 through 2.10) were further evaluated in conjunction with background data, as available.

(2) BTVs, hypothesis testing and geochemical analysis are presented in Attachment D.

(3) The comparisons of the maximum detected concentration for each area/medium/depth interval to the medium-specific BTVs is provided for surface soil, subsurface soil, hydric surface soil, hydric subsurface soil, and sediment in the preliminary COPC selection tables; Tables 2.1, 2.2, 2.3, 2.4, and 2.8, respectively.

(4) Preliminary COPCs for which an appropriate background dataset is not available or which were not identified as being consistent with background (in the associated area/medium/depth interval) are selected as site-related COPCs for further evaluation in the human health risk assessment.

(5) Analyte was either not detected or not detected at a high enough frequency in the background samples to calculate a BTV.

(6) Analyte was not detected at a high enough frequency in the site dataset to perform the hypothesis test.

TABLE 3-3.1
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Surface Soil (0 - 1 feet)

Exposure Point	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale (5)
On-Project	**Inorganics**										
Blue Beach Area	Antimony	7440-36-0	mg/kg	27 / 27	2.85E-01	3.80E-01 (LN)	3.14E+00	3.80E-01	mg/kg	95% H-UCL	
	Cadmium	7440-43-9	mg/kg	26 / 27	9.71E-01	2.17E+00 (LN)	1.20E+01	2.17E+00	mg/kg	95% KM H-UCL	
	PCBs										
	Total PCB Aroclors	Tot-PCB-ARO	mg/kg	3 / 3	3.40E-01	3.10E-01	4.80E-01	3.10E-01	mg/kg	Weighted mean UCL	(a)
	SVOCs										
	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	24 / 27	1.70E-02	3.09E-02 (G)	1.30E-01	3.09E-02	mg/kg	95% Gamma Adjusted KM-UCL	
Off-Project Red Maple	**PCBs**										
Swamp / Tidal Stream Area	Total PCB Aroclors	Tot-PCB-ARO	mg/kg	3 / 9	9.31E-02	N/A	2.50E-01	2.50E-01	mg/kg	Maximum Concentration	(b)

TABLE 3-3.1

EXPOSURE POINT CONCENTRATION SUMMARY

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Soil
Exposure Medium:	Surface Soil (0 - 1 feet)

Exposure Point	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale (5)

Notes:
% = percent.
CAS = Chemical Abstracts Service.
COPC = Chemical of potential concern.
EPC = Exposure point concentration
ISM = Incremental Sampling Methodology
ITRC ISM calculator = Interstate Technology & Regulatory Council Incremental Sampling Methodology Calculator. 2012. (https://www.itrcweb.org/GuidanceDocuments/ISM-1_2012_with_Clarifications.pd
mg/kg = Milligrams per kilogram.
N/A = Not Available/Applicable.
PCBs = Polychlorinated biphenyls
SU = Sampling unit.
SVOCs = Semivolatile organic compounds.
UCL = Upper confidence limit.
USEPA = United States Environmental Protection Agency

(1) Arithmetic means were calculated as follows:
Total PCB results for the on-Project Blue Beach area are associated with ISM soil samples collected from three SUs. The value is equal to the arithmetic mean concentration of the SU-specific 95% UCLs calculated using the ITRC ISM calculator (presented in Attachment C).
For all other COPCs, where there is at least one non-detect, the value is equal to the Kaplan-Meier (KM) mean calculated using USEPA's ProUCL software referenced in footnote (2). For datasets in which there are 100% detected results, a KM mean can not be calculated, and the mean of the detected results is used.

(2) UCLs were calculated as follows:
Total PCB results for the on-Project Blue Beach area are associated with ISM soil samples collected from three SUs. The value is equal to the weighted mean concentration of the SU-specific UCLs based on SU size (acreage). SU-specific UCLs are equal to the 95% UCL (calculated using the ITRC ISM calculator, presented in Attachment C).
For all other COPCs, UCL calculations were performed using USEPA's ProUCL software version 5.1.002. For data sets with multiple detection limits for non-detects, the use of the Kaplan Meier non-parametric test procedure is recommended and used to calculate an appropriate UCL. For the Kaplan Meier test procedure, the type of data distribution was determined using a series of tests (Shapiro-Wilk, Kolmogorov-Smirnov, Anderson-Darling) for normal, lognormal, or gamma data distributions. The results of these distribution tests determined which UCL calculation was performed.
NP = Non-parametric; N = Normal; LN = Lognormal; G = Gamma; N/A = Not applicable; NC = Not calculated.

(3) Equal to the maximum detected concentration.
Total PCB results for the on-Project Blue Beach area are associated with ISM soil samples collected from three SUs. The value is equal to the maximum concentration of the SU-specific 95% UCLs calculated using the ITRC ISM calculator (presented in Attachment C).

(4) Refer to ProUCL output in Attachment B for the selected UCL and the ProUCL Version 5.1 User Guide (USEPA, 2015) for further information regarding each method.
Maximum Concentration = Maximum detected concentration.

(5) The UCL suggested by ProUCL is used, unless otherwise noted.
(a) For total PCB results for the on-Project Blue Beach area, the weighted mean UCL concentration [described in footnote (2)] is usec
(b) Maximum detected concentration used as the EPC due to the low number of detections

TABLE 3-3.2
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Soil
Exposure Medium:	Subsurface Soil (1 - 15 feet)*

Exposure Point	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale (5)
On-Project	**Inorganics**										
Blue Beach Area	Antimony	7440-36-0	mg/kg	26 / 27	2.72E-01	3.51E-01 (LN)	3.75E+00	3.51E-01	mg/kg	95% KM H-UCL	
	Cadmium	7440-43-9	mg/kg	32 / 37	9.00E-01	2.12E+00 (LN)	9.06E+00	2.12E+00	mg/kg	95% KM (Chebyshev) UCL	
	PCBs										
	Total PCB Aroclors	Tot-PCB-ARO	mg/kg	3 / 3	2.40E-01	1.30E-01	4.90E-01	1.30E-01	mg/kg	Weighted mean UCL	(a)
	VOCs										
	1,2,4-Trimethylbenzene	95-63-6	mg/kg	7 / 37	2.43E+00	1.15E+01 (G)	6.33E+01	1.15E+01	mg/kg	95% Gamma Adjusted KM-UCL	
	Ethylbenzene	100-41-4	mg/kg	6 / 38	2.11E+00	1.60E+01 (G)	7.79E+01	1.60E+01	mg/kg	95% Gamma Adjusted KM-UCL	
	Total Xylenes	Tot-Xylenes	mg/kg	7 / 38	1.32E+01	1.01E+02 (G)	4.90E+02	1.01E+02	mg/kg	95% Gamma Adjusted KM-UCL	
	Trichloroethylene	79-01-6	mg/kg	9 / 37	1.49E-01	7.41E-01 (LN)	2.58E+00	7.41E-01	mg/kg	97.5% KM (Chebyshev) UCL	
Off-Project	**Inorganics**										
Red Maple	Arsenic	7440-38-2	mg/kg	6 / 6	4.47E+00	5.99E+00 (N)	7.60E+00	5.99E+00	mg/kg	95% Student's-t UCL	
Swamp / Tidal	**SVOCs**										
Stream Area	Benzo(a)Pyrene	50-32-8	mg/kg	2 / 16	2.34E-01	N/A	8.60E-01 J	8.60E-01	mg/kg	Maximum Concentration	(b)
	Naphthalene	91-20-3	mg/kg	13 / 16	1.76E+00	5.81E+00 (LN)	1.48E+01	5.81E+00	mg/kg	95% KM (Chebyshev) UCL	(c)
	VOCs										
	Ethylbenzene	100-41-4	mg/kg	16 / 18	2.16E+00	3.17E+00 (N)	9.70E+00	3.17E+00	mg/kg	95% KM (t) UCL	
	Naphthalene	91-20-3	mg/kg	16 / 18	5.09E+00	8.69E+00 (G)	1.98E+01 J	8.69E+00	mg/kg	95% Gamma Adjusted KM-UCL	(c)

TABLE 3-3.2

EXPOSURE POINT CONCENTRATION SUMMARY

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Soil
Exposure Medium:	Subsurface Soil (1 - 15 feet)*

Exposure Point	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale (5)

Notes:

*This soil depth interval includes one soil sample collected from a depth of 14.25 to 15.5 feet below ground surface

% = percent.

CAS = Chemical Abstracts Service.

EPC = Exposure point concentration

ISM = Incremental Sampling Methodology

ITRC ISM calculator = Interstate Technology & Regulatory Council Incremental Sampling Methodology Calculator. 2012. (https://www.itrcweb.org/GuidanceDocuments/ISM-1_2012_with_Clarifications.pd

mg/kg = Milligrams per kilogram.

PCBs = Polychlorinated biphenyls

SU = Sampling unit.

SVOCs = Semivolatile organic compounds.

UCL = Upper confidence limit.

USEPA = United States Environmental Protection Agency

VOCs = Volatile organic compounds.

(1) Arithmetic means were calculated as follows:

Total PCB results for the on-Project Blue Beach area are associated with ISM soil samples collected from three SUs. The value is equal to the arithmetic mean concentration of the SU-specific 95% UCLs calculated using the ITRC ISM calculator (presented in Attachment C).

For all other COPCs, where there is at least one non-detect, the value is equal to the Kaplan-Meier (KM) mean calculated using USEPA's ProUCL software referenced in footnote (2). For datasets in which there are 100% detected results, a KM mean can not be calculated, and the mean of the detected results is used.

(2) UCLs were calculated as follows:

Total PCB results for the on-Project Blue Beach area are associated with ISM soil samples collected from three SUs. The value is equal to the weighted mean concentration of the SU-specific UCLs based on SU size (acreage). SU-specific UCLs are equal to the 95% UCL (calculated using the ITRC ISM calculator, presented in Attachment C).

For all other COPCs, UCL calculations were performed using USEPA's ProUCL software version 5.1.002. For data sets with multiple detection limits for non-detects, the use of the Kaplan Meier non-parametric test procedure is recommended and used to calculate an appropriate UCL. For the Kaplan Meier test procedure, the type of data distribution was determined using a series of tests (Shapiro-Wilk, Kolmogorov-Smirnov, Anderson-Darling) for normal, lognormal, or gamma data distributions. The results of these distribution tests determined which UCL calculation was performed.

NP = Non-parametric; N = Normal; LN = Lognormal; G = Gamma; N/A = Not applicable; NC = Not calculated.

(3) Equal to the maximum detected concentration.

Total PCB results for the on-Project Blue Beach area are associated with ISM soil samples collected from three SUs. The value is equal to the maximum concentration of the SU-specific 95% UCLs calculated using the ITRC ISM calculator (presented in Attachment C).

J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.

(4) Refer to ProUCL output in Attachment B for the selected UCL and the ProUCL Version 5.1 User Guide (USEPA, 2015) for further information regarding each method.

Maximum Concentration = Maximum detected concentration.

(5) The UCL suggested by ProUCL is used, unless otherwise noted.

(a) For total PCB results for the on-Project Blue Beach area, the weighted mean UCL concentration [described in footnote (2)] is used.

(b) Maximum detected concentration used for EPC. ProUCL does not provide a recommended UCL due to the low number of detections.

(c) Naphthalene was analyzed via both SVOC and VOC methods. The higher of the EPCs (i.e., the EPC presented for the VOC method) is the selected EPC for further evaluation of naphthalene in subsurface soil within the off-Project Red Maple Swamp / tidal stream area in the risk assessment.

TABLE 3-3.3
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Hydric Soil
Exposure Medium:	Surface Hydric Soil (0 - 1 feet)

Exposure Point	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale (5)
Off-Project	**Inorganics**										
Red Maple	Arsenic	7440-38-2	mg/kg	16 / 16	8.65E+00	1.06E+01 (N)	1.63E+01	1.06E+01	mg/kg	95% Student's-t UCL	
Swamp / Tidal	Thallium	7440-28-0	mg/kg	7 / 10	1.30E-01	1.74E-01 (N)	2.66E-01	1.74E-01	mg/kg	95% KM (t) UCL	
Stream Area	**PCBs**										
	Total PCB Aroclors	Tot-PCB-ARO	mg/kg	10 / 16	6.89E-01	1.01E+00 (N)	2.30E+00	1.01E+00	mg/kg	95% KM (t) UCL	
	SVOCs										
	Benzo(a)Pyrene	50-32-8	mg/kg	10 / 10	6.27E-01	1.85E+00 (G)	3.00E+00	1.85E+00	mg/kg	95% Adjusted Gamma UCL	
	Benzo(b)fluoranthene	205-99-2	mg/kg	10 / 10	8.41E-01	2.35E+00 (G)	4.30E+00	2.35E+00	mg/kg	95% Adjusted Gamma UCL	
	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	8 / 10	9.78E-02	3.53E-01 (G)	4.90E-01	3.53E-01	mg/kg	95% Gamma Adjusted KM-UCL	(a)
	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	9 / 10	5.06E-01	2.72E+00 (G)	3.30E+00	2.72E+00	mg/kg	95% Gamma Adjusted KM-UCL	(a)

Notes:
% = percent.
CAS = Chemical Abstracts Service.
EPC = Exposure point concentration.
mg/kg = Milligrams per kilogram.
PCBs = Polychlorinated biphenyls.
SVOCs = Semivolatile organic compounds.
UCL = Upper confidence limit.
USEPA = United States Environmental Protection Agency.
(1) For datasets where there is at least one non-detect, the value is equal to the Kaplan-Meier (KM) mean calculated using USEPA's ProUCL software referenced in footnote (2). For datasets in which there are 100% detected results, a KM mean can not be calculated, and the mean of the detected results is used.
(2) UCL calculations were performed using USEPA's ProUCL software version 5.1.002. For data sets with multiple detection limits for non-detects, the use of the Kaplan Meier non-parametric test procedure is recommended and used to calculate an appropriate UCL. For the Kaplan Meier test procedure, the type of data distribution was determined using a series of tests (Shapiro-Wilk, Kolmogorov-Smirnov, Anderson-Darling) for normal, lognormal, or gamma data distributions. The results of these distribution tests determined which UCL calculation was performed.
NP = Non-parametric; N = Normal; LN = Lognormal; G = Gamma; N/A = Not applicable; NC = Not calculated.
(3) Equal to the maximum detected concentration.
(4) Refer to ProUCL output in Attachment B for the selected UCL and the ProUCL Version 5.1 User Guide (USEPA, 2015) for further information regarding each method.
(5) The UCL suggested by ProUCL is used, unless otherwise noted.
(a) ProUCL recommends two UCLs; one of which is greater than the maximum detected concentration. Therefore, the recommended UCL that is less than the maximum detected concentration is selected as the EPC.

TABLE 3-3.4

EXPOSURE POINT CONCENTRATION SUMMARY

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Future
Medium:	Hydric Soil
Exposure Medium:	Subsurface Hydric Soil (1 - 2 feet)

Exposure Point	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale (5)
Off-Project	**Inorganics**										
Red Maple	Thallium	7440-28-0	mg/kg	5 / 10	7.88E-02	1.14E-01 (N)	1.32E-01 J	1.14E-01	mg/kg	95% KM (t) UCL	
Swamp / Tidal	**PCBs**										
Stream Area	Total PCB Aroclors	Tot-PCB-ARO	mg/kg	1 / 16	2.20E+00	N/A	2.20E+00	2.20E+00	mg/kg	Maximum Concentration	(a)

Notes:
% = percent.
CAS = Chemical Abstracts Service.
EPC = Exposure point concentration.
mg/kg = Milligrams per kilogram.
PCBs = Polychlorinated biphenyls.
UCL = Upper confidence limit.
USEPA = United States Environmental Protection Agency.

(1) For datasets where there is more than one detected result, the value is equal to the Kaplan-Meier (KM) mean calculated using USEPA's ProUCL software referenced in footnote (2). For datasets with only one result, a KM mean cannot be calculated; therefore, the detected result is presented.

(2) UCL calculations were performed using USEPA's ProUCL software version 5.1.002. For data sets with multiple detection limits for non-detects, the use of the Kaplan Meier non-parametric test procedure is recommended and used to calculate an appropriate UCL. For the Kaplan Meier test procedure, the type of data distribution was determined using a series of tests (Shapiro-Wilk, Kolmogorov-Smirnov, Anderson-Darling) for normal, lognormal, or gamma data distributions. The results of these distribution tests determined which UCL calculation was performed.
NP = Non-parametric; N = Normal; LN = Lognormal; G = Gamma; N/A = Not applicable; NC = Not calculated.

(3) Equal to the maximum detected concentration.
J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.

(4) Refer to ProUCL output in Attachment B for the selected UCL and the ProUCL Version 5.1 User Guide (USEPA, 2015) for further information regarding each method.
Maximum Concentration = Maximum detected concentration.

(5) The UCL suggested by ProUCL is used, unless otherwise noted.
(a) Maximum detected concentration used for EPC due to the low number of detections. UCL not calculated by ProUCL.

TABLE 3-3.5
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Point (6)	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale (5)
On-Project	**Inorganics**										
Blue Beach Area	Antimony	7440-36-0	ug/L	3 / 11	3.47E-01	N/A	2.22E+00	2.22E+00	ug/L	Maximum Concentration	(a)
	Arsenic	7440-38-2	ug/L	16 / 40	2.16E+00	2.94E+00 (N)	1.15E+01	2.94E+00	ug/L	95% KM (t) UCL	
	Barium	7440-39-3	ug/L	39 / 40	7.69E+01	1.20E+02 (LN)	8.52E+02 J	1.20E+02	ug/L	95% KM H-UCL	
	Cadmium	7440-43-9	ug/L	23 / 39	1.37E+00	4.92E+00 (NP)	3.12E+01	4.92E+00	ug/L	95% KM (Chebyshev) UCL	
	Chromium	7440-47-3	ug/L	17 / 40	3.29E+01	1.07E+02 (LN)	6.24E+02 J	1.07E+02	ug/L	95% KM (Chebyshev) UCL	
	Cobalt	7440-48-4	ug/L	9 / 11	1.40E+00	4.19E+00 (G)	6.56E+00	4.19E+00	ug/L	95% Gamma Adjusted KM-UCL	(b)
	Iron	7439-89-6	ug/L	8 / 11	1.26E+04	6.03E+04 (G)	6.82E+04	6.03E+04	ug/L	95% Gamma Adjusted KM-UCL	(c)
	Lead	7439-92-1	ug/L	20 / 40	1.91E+01	7.92E+01 (LN)	2.75E+02 J	1.91E+01	ug/L	Mean Concentration	(d)
	Manganese	7439-96-5	ug/L	11 / 11	8.47E+02	4.16E+03 (G)	3.18E+03	3.18E+03	ug/L	Maximum Concentration	(e)
	SVOCs										
	1-Methylnaphthalene	90-12-0	ug/L	3 / 11	1.50E+01	N/A	9.00E+01	9.00E+01	ug/L	Maximum Concentration	(a)
	2-Methylnaphthalene	91-57-6	ug/L	2 / 11	1.07E+01	N/A	8.50E+01	8.50E+01	ug/L	Maximum Concentration	(a)
	Benzo(a)anthracene	56-55-3	ug/L	5 / 11	9.21E-02	1.38E-01 (N)	2.60E-01	1.38E-01	ug/L	95% KM (t) UCL	
	Benzo(a)Pyrene	50-32-8	ug/L	4 / 11	1.06E-01	1.41E-01 (N)	2.20E-01	1.41E-01	ug/L	95% KM (t) UCL	
	Benzo(b)fluoranthene	205-99-2	ug/L	4 / 11	1.46E-01	2.05E-01 (N)	3.80E-01	2.05E-01	ug/L	95% KM (t) UCL	
	Naphthalene	91-20-3	ug/L	3 / 11	3.74E+01	N/A	2.50E+02	2.50E+02	ug/L	Maximum Concentration	(a)(g)
	VOCs										
	1,1,2,2-Tetrachloroethane	79-34-5	ug/L	1 / 42	2.00E-01	N/A	2.00E-01 J	2.00E-01	ug/L	Maximum Concentration	(f)
	1,1,2-Trichloroethane	79-00-5	ug/L	2 / 42	2.62E-01	N/A	4.00E-01 J	4.00E-01	ug/L	Maximum Concentration	(a)
	1,1-Dichloroethane	75-34-3	ug/L	5 / 42	2.15E-01	1.99E-01 (LN)	3.20E+00	1.99E-01	ug/L	95% KM H-UCL	
	1,2,4-Trimethylbenzene	95-63-6	ug/L	8 / 42	8.19E+00	5.84E+01 (LN)	3.20E+02 J	5.84E+01	ug/L	97.5% KM (Chebyshev) UCL	
	1,2-Dichloropropane	78-87-5	ug/L	1 / 42	9.40E-01	N/A	9.40E-01	9.40E-01	ug/L	Maximum Concentration	(f)
	Chloroform	67-66-3	ug/L	4 / 42	1.52E-01	1.99E-01 (N)	6.30E-01	1.99E-01	ug/L	95% KM (t) UCL	
	cis-1,2-Dichloroethene	156-59-2	ug/L	20 / 42	3.39E+00	7.44E+00 (G)	3.92E+01 J	7.44E+00	ug/L	95% Gamma Adjusted KM-UCL	
	Ethylbenzene	100-41-4	ug/L	6 / 42	4.84E-01	8.97E-01 (N)	7.50E+00	8.97E-01	ug/L	95% KM (t) UCL	
	Naphthalene	91-20-3	ug/L	11 / 31	2.55E+01	1.88E+02 (NP)	7.80E+02	1.88E+02	ug/L	97.5% KM (Chebyshev) UCL	(g)
	Tetrachloroethene	127-18-4	ug/L	18 / 42	6.15E-01	1.04E+00 (G)	5.80E+00	1.04E+00	ug/L	95% Gamma Adjusted KM-UCL	
	Total Xylenes	Tot-Xylenes	ug/L	7 / 42	1.83E+00	8.99E+00 (NP)	4.10E+01	8.99E+00	ug/L	97.5% KM (Chebyshev) UCL	
	Trichloroethylene	79-01-6	ug/L	25 / 42	1.55E+01	3.25E+01 (G)	1.80E+02	3.25E+01	ug/L	95% Gamma Adjusted KM-UCL	
	Vinyl Chloride	75-01-4	ug/L	2 / 42	3.16E-01	N/A	2.00E+00	2.00E+00	ug/L	Maximum Concentration	(a)

TABLE 3-3.5

EXPOSURE POINT CONCENTRATION SUMMARY

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Point (6)	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale (5)

Notes:

% = percent.

CAS = Chemical Abstracts Service.

COPC = Chemical of potential concern.

EPC = Exposure point concentration.

SVOCs = Semivolatile organic compounds.

UCL = Upper confidence limit.

ug/L = Micrograms per liter.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) For datasets where there is more than one detected result and at least one non-detect result, the value is equal to the Kaplan-Meier (KM) mean calculated using USEPA's ProUCL software referenced in footnote (2). For datasets with 100% detected results or only one detected result, a KM mean cannot be calculated; the value presented is the mean of the detected results or the detected result, respectively.

(2) UCL calculations were performed using USEPA's ProUCL software version 5.1.002. For data sets with multiple detection limits for non-detects, the use of the Kaplan Meier non-parametric test procedure is recommended and used to calculate an appropriate UCL. For the Kaplan Meier test procedure, the type of data distribution was determined using a series of tests (Shapiro-Wilk, Kolmogorov-Smirnov, Anderson-Darling) for normal, lognormal, or gamma data distributions. The results of these distribution tests determined which UCL calculation was performed.
NP = Non-parametric; N = Normal; LN = Lognormal; G = Gamma; N/A = Not applicable; NC = Not calculated.

(3) Equal to the maximum detected concentration.
J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.

(4) Refer to ProUCL output in Attachment B for the selected UCL and the ProUCL Version 5.1 User Guide (USEPA, 2015) for further information regarding each method.
Maximum Concentration = Maximum detected concentration.

(5) The UCL suggested by ProUCL is used, unless otherwise noted.
(a) Maximum detected concentration used for EPC due to low number of detections. ProUCL-calculated UCL is provided, but is not recommended for use.
(b) ProUCL recommends two UCLs. The higher of two recommended UCLs is selected for use.
(c) ProUCL recommends two UCLs; one of which is greater than the maximum detected concentration. Therefore, the recommended UCL that is less than the maximum detected concentration is selected as the EPC.
(d) The mean concentration is selected as the EPC for lead, in accordance with USEPA guidance, as discussed in the risk assessment report text.
(e) 95% UCL exceeds maximum detected concentration. Therefore, the maximum concentration is used for the EPC.
(f) Maximum detected concentration used for EPC due to the low number of detections. UCL not calculated by ProUCL.
(g) Naphthalene was analyzed via both SVOC and VOC methods. The higher of the EPCs (i.e., the EPC presented for the SVOC method) is the selected EPC for further evaluation of naphthalene in groundwater within the on-Project Blue Beach area in the risk assessment.

(6) Groundwater results from wells MW-101S and MW-103 were removed from the groundwater dataset used to calculate EPCs. Groundwater concentrations in these wells are not detected above screening levels and are not considered to be within the area of higher groundwater concentrations.

TABLE 3-3.6
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Shower Air

Exposure Point (5)	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale
On-Project	**SVOCs**										
Blue Beach Area	1-Methylnaphthalene	90-12-0	ug/L	3 / 11	1.50E+01	N/A	9.00E+01	8.40E+02	ug/m^3	Shower model	
	2-Methylnaphthalene	91-57-6	ug/L	2 / 11	1.07E+01	N/A	8.50E+01	7.95E+02	ug/m^3	Shower model	
	Benzo(a)anthracene	56-55-3	ug/L	5 / 11	9.21E-02	1.38E-01 (N)	2.60E-01	8.07E-02	ug/m^3	Shower model	
	Naphthalene	91-20-3	ug/L	3 / 11	3.74E+01	N/A	2.50E+02	2.33E+03	ug/m^3	Shower model	(5)
	VOCs										
	1,1,2,2-Tetrachloroethane	79-34-5	ug/L	1 / 42	2.00E-01	N/A	2.00E-01 J	1.56E+00	ug/m^3	Shower model	
	1,1,2-Trichloroethane	79-00-5	ug/L	2 / 42	2.62E-01	N/A	4.00E-01 J	4.27E+00	ug/m^3	Shower model	
	1,1-Dichloroethane	75-34-3	ug/L	5 / 42	2.15E-01	1.99E-01 (LN)	3.20E+00	2.84E+00	ug/m^3	Shower model	
	1,2,4-Trimethylbenzene	95-63-6	ug/L	8 / 42	8.19E+00	5.84E+01 (LN)	3.20E+02 J	7.77E+02	ug/m^3	Shower model	
	1,2-Dichloropropane	78-87-5	ug/L	1 / 42	9.40E-01	N/A	9.40E-01	1.24E+01	ug/m^3	Shower model	
	Chloroform	67-66-3	ug/L	4 / 42	1.52E-01	1.99E-01 (N)	6.30E-01	2.60E+00	ug/m^3	Shower model	
	cis-1,2-Dichloroethene	156-59-2	ug/L	20 / 42	3.39E+00	7.44E+00 (G)	3.92E+01 J	1.06E+02	ug/m^3	Shower model	
	Ethylbenzene	100-41-4	ug/L	6 / 42	4.84E-01	8.97E-01 (N)	7.50E+00	1.26E+01	ug/m^3	Shower model	
	Naphthalene	91-20-3	ug/L	11 / 31	2.55E+01	1.88E+02 (NP)	7.80E+02	1.75E+03	ug/m^3	Shower model	(5)
	Tetrachloroethene	127-18-4	ug/L	18 / 42	6.15E-01	1.04E+00 (G)	5.80E+00	1.25E+01	ug/m^3	Shower model	
	Total Xylenes	Tot-Xylenes	ug/L	7 / 42	1.83E+00	8.99E+00 (NP)	4.10E+01	1.26E+02	ug/m^3	Shower model	
	Trichloroethylene	79-01-6	ug/L	25 / 42	1.55E+01	3.25E+01 (G)	1.80E+02	4.22E+02	ug/m^3	Shower model	
	Vinyl Chloride	75-01-4	ug/L	2 / 42	3.16E-01	N/A	2.00E+00	3.44E+01	ug/m^3	Shower model	

TABLE 3-3.6

EXPOSURE POINT CONCENTRATION SUMMARY

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Shower Air

Exposure Point (5)	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale

Notes:

% = percent.

CAS = Chemical Abstracts Service.

COPC = Chemical of potential concern.

EPC = Exposure point concentration.

SVOCs = Semivolatile organic compounds.

UCL = Upper confidence limit.

ug/L = Micrograms per liter.

ug/m^3 = Micrograms per cubic meter.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) For datasets where there is more than one detected result and at least one non-detect result, the value is equal to the Kaplan-Meier (KM) mean calculated using USEPA's ProUCL software referenced in footnote (2). For datasets with 100% detected results or only one detected result, a KM mean cannot be calculated; the value presented is the mean of the detected results or the detected result, respectively.

(2) UCL calculations were performed using USEPA's ProUCL software version 5.1.002. For data sets with multiple detection limits for non-detects, the use of the Kaplan Meier non-parametric test procedure is recommended and used to calculate an appropriate UCL. For the Kaplan Meier test procedure, the type of data distribution was determined using a series of tests (Shapiro-Wilk, Kolmogorov-Smirnov, Anderson-Darling) for normal, lognormal, or gamma data distributions. The results of these distribution tests determined which UCL calculation was performed. NP = Non-parametric; N = Normal; LN = Lognormal; G = Gamma; N/A = Not applicable; NC = Not calculated.

(3) Equal to the maximum detected concentration.
J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.

(4) The shower air EPCs were estimated based on the groundwater EPC (presented in Table 3.5.RME) using the Foster and Chrostowski (1987) shower model (presented in Attachment E-3), as discussed in the HHRA text.

(5) Naphthalene was analyzed via both SVOC and VOC methods. The higher of the EPCs (i.e., the EPC presented for the SVOC method) is the selected EPC for further evaluation of naphthalene in the risk assessment.

TABLE 3-3.7

EXPOSURE POINT CONCENTRATION SUMMARY

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Shallow Groundwater

Exposure Point (6)	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale (5)
On-Project	**Inorganics**										
Blue Beach Area	Antimony	7440-36-0	ug/L	3 / 11	3.47E-01	N/A	2.22E+00	2.22E+00	ug/L	Maximum Concentration	(a)
	Arsenic	7440-38-2	ug/L	4 / 17	2.55E+00	4.04E+00 (N)	1.15E+01	4.04E+00	ug/L	95% KM (t) UCL	
	Cadmium	7440-43-9	ug/L	10 / 17	1.99E+00	2.06E+01 (NP)	3.12E+01	2.06E+01	ug/L	99% KM (Chebyshev) UCL	
	Cobalt	7440-48-4	ug/L	9 / 11	1.40E+00	4.29E+00 (G)	6.56E+00	4.29E+00	ug/L	95% KM Bootstrap t UCL	(b)
	Iron	7439-89-6	ug/L	8 / 11	1.26E+04	6.03E+04 (G)	6.82E+04	6.03E+04	ug/L	95% Gamma Adjusted KM-UCL	(c)
	Manganese	7439-96-5	ug/L	11 / 11	8.47E+02	4.16E+03 (G)	3.18E+03	3.18E+03	ug/L	Maximum Concentration	(d)
	SVOCs										
	1-Methylnaphthalene	90-12-0	ug/L	3 / 11	1.50E+01	N/A	9.00E+01	9.00E+01	ug/L	Maximum Concentration	(a)
	2-Methylnaphthalene	91-57-6	ug/L	2 / 11	1.07E+01	N/A	8.50E+01	8.50E+01	ug/L	Maximum Concentration	(a)
	Benzo(a)anthracene	56-55-3	ug/L	5 / 11	9.21E-02	1.38E-01 (N)	2.60E-01	1.38E-01	ug/L	95% KM (t) UCL	
	Benzo(a)Pyrene	50-32-8	ug/L	4 / 11	1.06E-01	1.41E-01 (N)	2.20E-01	1.41E-01	ug/L	95% KM (t) UCL	
	Benzo(b)fluoranthene	205-99-2	ug/L	4 / 11	1.46E-01	2.05E-01 (N)	3.80E-01	2.05E-01	ug/L	95% KM (t) UCL	
	Naphthalene	91-20-3	ug/L	3 / 11	3.74E+01	N/A	2.50E+02	2.50E+02	ug/L	Maximum Concentration	(a)
	VOCs										
	1,2,4-Trimethylbenzene	95-63-6	ug/L	3 / 17	1.95E+01	N/A	3.20E+02 J	3.20E+02	ug/L	Maximum Concentration	(a)
	1,2-Dichloropropane	78-87-5	ug/L	1 / 17	9.40E-01	N/A	9.40E-01	9.40E-01	ug/L	Maximum Concentration	(e)
	cis-1,2-Dichloroethene	156-59-2	ug/L	6 / 17	1.27E+00	2.28E+00 (N)	8.40E+00	2.28E+00	ug/L	95% KM (t) UCL	
	Ethylbenzene	100-41-4	ug/L	2 / 17	7.12E-01	N/A	4.80E+00 J	4.80E+00	ug/L	Maximum Concentration	(a)
	Total Xylenes	Tot-Xylenes	ug/L	1 / 17	4.10E+01	N/A	4.10E+01	4.10E+01	ug/L	Maximum Concentration	(e)
	Trichloroethylene	79-01-6	ug/L	7 / 17	1.36E+01	2.52E+01 (N)	7.50E+01	2.52E+01	ug/L	95% KM (t) UCL	

TABLE 3-3.7

EXPOSURE POINT CONCENTRATION SUMMARY

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Shallow Groundwater

Exposure Point (6)	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale (5)

Notes:

% = percent.

CAS = Chemical Abstracts Service.

COPC = Chemical of potential concern.

EPC = Exposure point concentration.

SVOCs = Semivolatile organic compounds.

UCL = Upper confidence limit.

ug/L = Micrograms per liter.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) For datasets where there is more than one detected result and at least one non-detect result, the value is equal to the Kaplan-Meier (KM) mean calculated using USEPA's ProUCL software referenced in footnote (2). For datasets with 100% detected results or only one detected result, a KM mean cannot be calculated; the value presented is the mean of the detected results or the detected result, respectively.

(2) UCL calculations were performed using USEPA's ProUCL software version 5.1.002. For data sets with multiple detection limits for non-detects, the use of the Kaplan Meier non-parametric test procedure is recommended and used to calculate an appropriate UCL. For the Kaplan Meier test procedure, the type of data distribution was determined using a series of tests (Shapiro-Wilk, Kolmogorov-Smirnov, Anderson-Darling) for normal, lognormal, or gamma data distributions. The results of these distribution tests determined which UCL calculation was performed.
NP = Non-parametric; N = Normal; LN = Lognormal; G = Gamma; N/A = Not applicable; NC = Not calculated.

(3) Equal to the maximum detected concentration.
J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.

(4) Refer to ProUCL output in Attachment B for the selected UCL and the ProUCL Version 5.1 User Guide (USEPA, 2015) for further information regarding each method.
Maximum Concentration = Maximum detected concentration.

(5) The UCL suggested by ProUCL is used, unless otherwise noted.
(a) Maximum detected concentration used for EPC due to low number of detections. ProUCL-calculated UCL is provided, but is not recommended for use.
(b) ProUCL recommends two UCLs. The higher of two recommended UCLs is selected for use.
(c) ProUCL recommends two UCLs; one of which is greater than the maximum detected concentration. Therefore, the recommended UCL that is less than the maximum detected concentration is selected as the EPC.
(d) ProUCL recommended UCL exceeds the maximum detected concentration. Therefore, the maximum concentration is used for the EPC.
(e) Maximum detected concentration used for EPC due to the low number of detections. UCL not calculated by ProUCL.

(6) Groundwater results from wells MW-101S and MW-103 were removed from the groundwater dataset used to calculate EPCs. Groundwater concentrations in these wells are not detected above screening levels and are not considered to be within the area of higher groundwater concentrations.

TABLE 3-3.8

EXPOSURE POINT CONCENTRATION SUMMARY

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Trench Air

Exposure Point (5)	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale
On-Project	**SVOCs**										
Blue Beach Area	1-Methylnaphthalene	90-12-0	ug/L	3 / 11	1.50E+01	N/A	9.00E+01	1.37E+00	ug/m^3	Trench model	
	2-Methylnaphthalene	91-57-6	ug/L	2 / 11	1.07E+01	N/A	8.50E+01	1.29E+00	ug/m^3	Trench model	
	Benzo(a)anthracene	56-55-3	ug/L	5 / 11	9.21E-02	1.38E-01 (N)	2.60E-01	5.68E-04	ug/m^3	Trench model	
	Naphthalene	91-20-3	ug/L	3 / 11	3.74E+01	N/A	2.50E+02	4.05E+00	ug/m^3	Trench model	
	VOCs										
	1,2,4-Trimethylbenzene	95-63-6	ug/L	3 / 17	1.95E+01	N/A	3.20E+02 J	5.11E+00	ug/m^3	Trench model	
	1,2-Dichloropropane	78-87-5	ug/L	1 / 17	9.40E-01	N/A	9.40E-01	1.83E-02	ug/m^3	Trench model	
	cis-1,2-Dichloroethene	156-59-2	ug/L	6 / 17	1.27E+00	2.28E+00 (N)	8.40E+00	5.20E-02	ug/m^3	Trench model	
	Ethylbenzene	100-41-4	ug/L	2 / 17	7.12E-01	N/A	4.80E+00 J	8.18E-02	ug/m^3	Trench model	
	Total Xylenes	Tot-Xylenes	ug/L	1 / 17	4.10E+01	N/A	4.10E+01	6.99E-01	ug/m^3	Trench model	
	Trichloroethylene	79-01-6	ug/L	7 / 17	1.36E+01	2.52E+01 (N)	7.50E+01	5.19E-01	ug/m^3	Trench model	

Notes:

CAS = Chemical Abstracts Service.

COPC = Chemical of potential concern.

EPC = Exposure point concentration.

SVOCs = Semivolatile organic compounds.

UCL = Upper confidence limit.

ug/L = Micrograms per liter.

ug/m³ = Micrograms per cubic meter.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) For datasets where there is more than one detected result, the value is equal to the Kaplan-Meier (KM) mean calculated using USEPA's ProUCL software referenced in footnote (2). For datasets with only one detected result, a KM mean cannot be calculated; the value presented is the detected result.

(2) UCL calculations were performed using USEPA's ProUCL software version 5.1.002. For data sets with multiple detection limits for non-detects, the use of the Kaplan Meier non-parametric test procedure is recommended and used to calculate an appropriate UCL. For the Kaplan Meier test procedure, the type of data distribution was determined using a series of tests (Shapiro-Wilk, Kolmogorov-Smirnov, Anderson-Darling) for normal, lognormal, or gamma data distributions. The results of these distribution tests determined which UCL calculation was performed.
NP = Non-parametric; N = Normal; LN = Lognormal; G = Gamma; N/A = Not applicable; NC = Not calculated.
The UCL recommended by ProUCL is used, unless otherwise noted. In cases where more than one UCL is suggested, the higher UCL is used, unless otherwise noted.

(3) Equal to the maximum detected concentration.
J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.

(4) Trench air EPCs were estimated based on the shallow groundwater EPCs (presented in Table 3.7.RME) using an attenuation factor calculated in a trench air model (presented in Attachment E-4), as discussed in the HHRA report text.

TABLE 3-3.9

EXPOSURE POINT CONCENTRATION SUMMARY

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Sediment

Exposure Point	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale (5)
Off-Project Red Maple Swamp / Tidal Stream Area	**PCBs** Total PCB Aroclors	Tot-PCB-ARO	mg/kg	10 / 18	2.91E-01	4.41E-01 (N)	1.50E+00	4.41E-01	mg/kg	95% KM (t) UCL	

Notes:

% = percent.

CAS = Chemical Abstracts Service.

EPC = Exposure point concentration.

mg/kg = Milligrams per kilogram.

PCBs = Polychlorinated biphenyls

UCL = Upper confidence limit.

USEPA = United States Environmental Protection Agency.

(1) Mean is equal to the Kaplan-Meier (KM) mean calculated using USEPA's ProUCL software referenced in footnote (2).

(2) UCL calculations were performed using USEPA's ProUCL software version 5.1.002. For data sets with multiple detection limits for non-detects, the use of the Kaplan Meier non-parametric test procedure is recommended and used to calculate an appropriate UCL. For the Kaplan Meier test procedure, the type of data distribution was determined using a series of tests (Shapiro-Wilk, Kolmogorov-Smirnov, Anderson-Darling) for normal, lognormal, or gamma data distributions. The results of these distribution tests determined which UCL calculation was performed. NP = Non-parametric; N = Normal; LN = Lognormal; G = Gamma; N/A = Not applicable; NC = Not calculated.

(3) Equal to the maximum detected concentration.

(4) Refer to ProUCL output in Attachment B for the selected UCL and the ProUCL Version 5.1 User Guide (USEPA, 2015) for further information regarding each method.

(5) The UCL suggested by ProUCL is used.

TABLE 3-3.10

EXPOSURE POINT CONCENTRATION SUMMARY

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Surface Water

Exposure Point	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale
Off-Project	**VOCs**										
Red Maple	1,2,3-Trichlorobenzene	87-61-6	ug/L	1 / 10	1.20E-01	N/A	1.20E-01 J	1.20E-01	ug/L	Maximum Concentration	(a)
Swamp / Tidal	Naphthalene	91-20-3	ug/L	1 / 10	1.80E-01	N/A	1.80E-01 J	1.80E-01	ug/L	Maximum Concentration	(a)
Stream Area											

Notes:

CAS = Chemical Abstracts Service.

EPC = Exposure point concentration.

ug/L = Micrograms per liter.

UCL = Upper confidence limit.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(1) For datasets with only one detected result a Kaplan-Meier (KM) mean is not calculated by USEPA's ProUCL software. The value is equal to the detected result.

(2) UCL calculations cannot be performed using USEPA's ProUCL software version 5.1.002 due to the low number of detections for the associated datasets.

(3) Equal to the maximum detected concentration.

J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.

(4) Provides basis for the selected EPC.

(a) Maximum detected concentration used for EPC due to the low number of detections.

TABLE 3-3.11

EXPOSURE POINT CONCENTRATION SUMMARY

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Future
Medium:	Soil Vapor
Exposure Medium:	Soil Vapor

Exposure Point	Chemical of Potential Concern	CAS Number	Units	Detection Frequency	Arithmetic Mean (1)	UCL (Distribution) (2)	Maximum Concentration (Qualifier) (3)	Exposure Point Concentration			
								Value	Units	Statistic (4)	Rationale
On-Project	**VOCs**										
Blue Beach Area	Benzene	71-43-2	ug/m^3	1 / 6	1.60E+02	N/A	1.60E+02	1.60E+02	ug/m^3	Maximum Concentration	(a)
	n-Heptane	142-82-5	ug/m^3	1 / 6	1.40E+03	N/A	1.40E+03	1.40E+03	ug/m^3	Maximum Concentration	(a)
	Vinyl Chloride	75-01-4	ug/m^3	1 / 6	1.80E+02	N/A	1.80E+02	1.80E+02	ug/m^3	Maximum Concentration	(a)

Notes:
CAS = Chemical Abstracts Service.
EPC = Exposure point concentration.
N/A = Not Applicable.
UCL = Upper confidence limit.
ug/m^3 = Micrograms per cubic meter.
USEPA = United States Environmental Protection Agency.
VOCs = Volatile organic compounds.
(1) For datasets with only one detected result a Kaplan-Meier (KM) mean is not calculated by USEPA's ProUCL software. The value is equal to the detected result.
(2) UCL calculations cannot be performed using USEPA's ProUCL software version 5.1.002 due to the low number of detections for the associated datasets.
(3) Equal to the maximum detected concentration.
(4) Provides basis for the selected EPC.
(a) Maximum detected concentration used for EPC due to the low number of detections.

TABLE 3-4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS - SURFACE SOIL AND SUBSURFACE SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Soil
Exposure Medium:	Surface soil; Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Incidental Ingestion	Outdoor Worker	Adult	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				IR	Ingestion Rate	100	mg/day	USEPA, 2014	CS x IR x EF x ED x CF x FI x RBA
				EF	Exposure Frequency	250	days/yr	USEPA, 2014	BW x AT
				ED	Exposure Duration	25	year	USEPA, 2014	
				FI	Fraction Ingested from Site	1	unitless	(1)	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				RBA	Relative Bioavailability Factor	0.6 (Arsenic only) / 1	unitless	USEPA, 2012	
				BW	Body Weight	80	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	9,125	days	USEPA, 1989	
	Hypothetical Future Resident	Adult	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				IR	Ingestion Rate	100	mg/day	USEPA, 2014	CS x IR x EF x ED x CF x FI x RBA
				EF	Exposure Frequency	350	days/yr	USEPA, 2014	BW x AT
				ED	Exposure Duration	20	years	USEPA, 2014	
				FI	Fraction Ingested from Site	1	unitless	(1)	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				RBA	Relative Bioavailability Factor	0.6 (Arsenic only) / 1	unitless	USEPA, 2012	
				BW	Body Weight	80	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	7,300	days	USEPA, 1989	
		Child	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				IR	Ingestion Rate	200	mg/day	USEPA, 2014	CS x IR x EF x ED x CF x FI x RBA
				EF	Exposure Frequency	350	days/yr	USEPA, 2014	BW x AT
				ED	Exposure Duration	6	years	USEPA, 2014	
				FI	Fraction Ingested from Site	1	unitless	(1)	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				RBA	Relative Bioavailability Factor	0.6 (Arsenic only) / 1	unitless	USEPA, 2012	
				BW	Body Weight	15	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	2,190	days	USEPA, 1989	

TABLE 3-4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS - SURFACE SOIL AND SUBSURFACE SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Medium: Soil
Exposure Medium: Surface soil; Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Incidental Ingestion	Trespasser	Adolescent (7 to <16 years)	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				IR	Ingestion Rate	100	mg/day	USEPA, 2014 (2)	CS x IR x EF x ED x CF x FI x RBA
				EF	Exposure Frequency	26	days/yr	(3)	BW x AT
				ED	Exposure Duration	9	years	(4)	
				FI	Fraction Ingested from Site	1	unitless	(1)	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				RBA	Relative Bioavailability Factor	0.6 (Arsenic only) / 1	unitless	USEPA, 2012	
				BW	Body Weight	44	kg	USEPA, 2011 (5)	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	3,285	days	USEPA, 1989	
	Recreational User	Adult	Off-Project Red Maple Swamp/Tidal Stream Area (Walking Path)	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				IR	Ingestion Rate	100	mg/day	USEPA, 2014 (2)	CS x IR x EF x ED x CF x FI x RBA
				EF	Exposure Frequency	26	days/yr	(3)	BW x AT
				ED	Exposure Duration	20	years	USEPA, 2014 (7)	
				FI	Fraction Ingested from Site	1	unitless	(1)	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				RBA	Relative Bioavailability Factor	0.6 (Arsenic only) / 1	unitless	USEPA, 2012	
				BW	Body Weight	80	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	7,300	days	USEPA, 1989	
		Child	Off-Project Red Maple Swamp/Tidal Stream Area (Walking Path)	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				IR	Ingestion Rate	200	mg/day	USEPA, 2014 (9)	CS x IR x EF x ED x CF x FI x RBA
				EF	Exposure Frequency	26	days/yr	(3)	BW x AT
				ED	Exposure Duration	6	years	USEPA, 2014 (8)	
				FI	Fraction Ingested from Site	1	unitless	(1)	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				RBA	Relative Bioavailability Factor	0.6 (Arsenic only) / 1	unitless	USEPA, 2012	
				BW	Body Weight	15	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	2,190	days	USEPA, 1989	

TABLE 3-4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS - SURFACE SOIL AND SUBSURFACE SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Soil
Exposure Medium:	Surface soil; Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Incidental Ingestion	Construction/Utility Worker	Adult	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				IR	Ingestion Rate	330	mg/day	USEPA, 2002	CS x IR x EF x ED x CF x FI x RBA
				EF	Exposure Frequency	40	days/yr	(17)	BW x AT
				ED	Exposure Duration	1	year	USEPA, 2002	
				FI	Fraction Ingested from Site	1	unitless	(1)	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				RBA	Relative Bioavailability Factor	0.6 (Arsenic only) / 1	unitless	USEPA, 2012	
				BW	Body Weight	80	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	365	days	USEPA, 1989	
Dermal	Outdoor Worker	Adult	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				SA	Surface Area	3,527	cm^2	USEPA, 2014 (10)	CS x SA x AF x ABS x EV x EF x ED x CF
				AF	Adherence Factor	0.12	mg/cm^2-event	USEPA, 2014 (11)	BW x AT
				ABS	Dermal absorption fraction	Chemical Specific	unitless	See Attachment E-1	
				EV	Event Frequency	1	event/day	(6)	
				EF	Exposure Frequency	250	days/yr	USEPA, 2014	
				ED	Exposure Duration	25	year	USEPA, 2014	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				BW	Body Weight	80	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	9,125	days	USEPA, 1989	

TABLE 3-4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS - SURFACE SOIL AND SUBSURFACE SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Soil
Exposure Medium:	Surface soil; Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Hypothetical Future Resident	Adult	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				SA	Surface Area	6,032	cm^2	USEPA, 2014 (12)	$\frac{CS \times SA \times AF \times ABS \times EV \times EF \times ED \times CF}{BW \times AT}$
				AF	Adherence Factor	0.07	mg/cm^2-event	USEPA, 2014 (13)	
				ABS	Dermal absorption fraction	Chemical Specific	unitless	See Attachment E-1	
				EV	Event Frequency	1	event/day	(6)	
				EF	Exposure Frequency	350	days/yr	USEPA, 2014	
				ED	Exposure Duration	20	years	USEPA, 2014	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				BW	Body Weight	80	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	7,300	days	USEPA, 1989	
		Child	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				SA	Surface Area	2,373	cm^2	USEPA, 2014 (14)	$\frac{CS \times SA \times AF \times ABS \times EV \times EF \times ED \times CF}{BW \times AT}$
				AF	Adherence Factor	0.2	mg/cm^2-event	USEPA, 2014 (15)	
				ABS	Dermal absorption fraction	Chemical Specific	unitless	See Attachment E-1	
				EV	Event Frequency	1	event/day	(6)	
				EF	Exposure Frequency	350	days/yr	USEPA, 2014	
				ED	Exposure Duration	6	years	USEPA, 2014	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				BW	Body Weight	15	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	2,190	days	USEPA, 1989	
	Trespasser	Adolescent (7 to <16 years)	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				SA	Surface Area	3,624	cm^2	USEPA, 2011 (16)	$\frac{CS \times SA \times AF \times ABS \times EV \times EF \times ED \times CF}{BW \times AT}$
				AF	Adherence Factor	0.07	mg/cm^2-event	USEPA, 2014 (2)(13)	
				ABS	Dermal absorption fraction	Chemical Specific	unitless	See Attachment E-1	
				EV	Event Frequency	1	event/day	(6)	
				EF	Exposure Frequency	26	days/yr	(3)	
				ED	Exposure Duration	9	years	(4)	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				BW	Body Weight	44	kg	USEPA, 2011 (5)	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	3,285	days	USEPA, 1989	

TABLE 3-4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS - SURFACE SOIL AND SUBSURFACE SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Soil
Exposure Medium:	Surface soil; Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational User	Adult	Off-Project Red Maple Swamp/Tidal Stream Area (Walking Path)	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				SA	Surface Area	6,032	cm^2	USEPA, 2014 (12)	$\frac{CS \times SA \times AF \times ABS \times EV \times EF \times ED \times CF}{BW \times AT}$
				AF	Adherence Factor	0.07	mg/cm^2-event	USEPA, 2014 (2)(13)	
				ABS	Dermal absorption fraction	Chemical Specific	unitless	See Attachment E-1	
				EV	Event Frequency	1	event/day	(6)	
				EF	Exposure Frequency	26	days/yr	(3)	
				ED	Exposure Duration	20	years	USEPA, 2014 (7)	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				BW	Body Weight	80	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	7,300	days	USEPA, 1989	
		Child	Off-Project Red Maple Swamp/Tidal Stream Area (Walking Path)	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				SA	Surface Area	2,373	cm^2	USEPA, 2014 (14)	$\frac{CS \times SA \times AF \times ABS \times EV \times EF \times ED \times CF}{BW \times AT}$
				AF	Adherence Factor	0.2	mg/cm^2-event	USEPA, 2014 (15)	
				ABS	Dermal absorption fraction	Chemical Specific	unitless	See Attachment E-1	
				EV	Event Frequency	1	event/day	(6)	
				EF	Exposure Frequency	26	days/yr	(3)	
				ED	Exposure Duration	6	years	USEPA, 2014 (8)	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				BW	Body Weight	15	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	2,190	days	USEPA, 1989	
	Construction/Utility Worker	Adult	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				SA	Surface Area	3,527	cm^2	USEPA, 2014 (10)	$\frac{CS \times SA \times AF \times ABS \times EV \times EF \times ED \times CF}{BW \times AT}$
				AF	Adherence Factor	0.3	mg/cm^2-event	USEPA, 2004 (18)	
				ABS	Dermal absorption fraction	Chemical Specific	unitless	See Attachment E-1	
				EV	Event Frequency	1	event/day	(6)	
				EF	Exposure Frequency	40	days/yr	(17)	
				ED	Exposure Duration	1	year	USEPA, 2002	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				BW	Body Weight	80	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	365	days	USEPA, 1989	

TABLE 3-4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS - SURFACE SOIL AND SUBSURFACE SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Soil
Exposure Medium:	Surface soil; Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

Notes:

< = Less than.

USEPA = United States Environmental Protection Agency.

(1) Professional judgment; conservatively assumes 100 percent of soil ingested is from the Site.

(2) Default value for adult resident.

(3) Assumes access to soils in the area may occur 1 day per week for 26 weeks (6 months) of the year, based on professional judgment.

(4) Exposure duration reflects age-range of 7 to <16 years.

(5) Weighted average body weight for adolescent ages 6 to 16 years old.

(6) Professional judgement; assumes one event per day.

(7) Default value for adult resident; assumes an adult recreational user accesses the area for 20 years.

(8) Default value for child resident; assumes a child recreational user accesses the area for 6 years.

(9) Default value for child resident.

(10) Represents the weighted mean surface area for males and females ages 21+, including head, hands, and forearms (USEPA, 2011; Table 7-2).

(11) Represents the arithmetic mean of weighted average of body-specific (hands, forearms, and face) mean adherence factors for adult commercial/industrial activities (USEPA, 2011; Table 7-20).

(12) Represents the weighted mean surface area for male and female adults, including head, hands, forearms, and lower legs (USEPA, 2011; Table 7-2).

(13) Represents the geometric mean (50th percentile) of weighted average body-specific (hands, forearms, lower legs and face) adherence factors for gardeners (USEPA, 2004; Exhibit C-2).

(14) Represents the weighted mean surface area for males and females ages 0 to <6 years old, including head, hands, forearms, lower legs, and feet (USEPA, 2011; Table 7-2).

(15) Represents the geometric mean (50th percentile) of weighted average body-specific (hands, forearms, lower legs and face) adherence factors for children playing (wet soil) (USEPA, 2004; Exhibit C-2).

(16) Represents the weighted mean surface area for males and females ages 6 to <16 years old, including hands, forearms, lower legs, and head (USEPA, 2011; Table 7-2).

(17) Construction/utility activities are assumed to occur for 40 days over the course of a 1 year period (for RME scenario), based on professional judgment.

(18) Represents the geometric mean (50th percentile) of weighted average body-specific (face, forearms, and hands) adherence factors for construction workers (USEPA, 2004; Exhibit C-2).

TABLE 3-4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS - SURFACE SOIL AND SUBSURFACE SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Soil
Exposure Medium:	Surface soil; Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

Sources:

USEPA, 1989. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. December 2002.

USEPA, 2004. Risk Assessment Guidance for Superfund. Part E, Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

USEPA, 2011. Exposure Factors Handbook. September 2011.

USEPA, 2012. Recommendations for default value for relative bioavailability of arsenic in soil. OSWER Directive 9200.1-113. December 2012.

USEPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. February 6, 2014. Revised September 2015.

Unit Intake Calculations

Incidental Ingestion Intake [(mg/kg-day)(kg/mg)] = (IR x EF x ED x CF x FI))/(BW x AT) [CS and RBA are factored into the risk calculation in Table 7s]

Dermal Intake [(mg/kg-day)(kg/mg)] = (SA x AF x EV x EF x ED x CF)/(BW x AT) [CS and ABS are factored into the risk calculation in Table 7s]

Outdoor Worker:	Cancer Ingestion Intake =	3.06E-07	Cancer Dermal Intake =	1.29E-06
Outdoor Worker:	Noncancer Ingestion Intake =	8.56E-07	Noncancer Dermal Intake =	3.62E-06
Resident - Adult:	Cancer Ingestion Intake =	3.42E-07	Cancer Dermal Intake =	1.45E-06
Resident - Adult:	Noncancer Ingestion Intake =	1.20E-06	Noncancer Dermal Intake =	5.06E-06
Resident - Child:	Cancer Ingestion Intake =	1.10E-06	Cancer Dermal Intake =	2.60E-06
Resident - Child:	Noncancer Ingestion Intake =	1.28E-05	Noncancer Dermal Intake =	3.03E-05
Trespasser:	Cancer Ingestion Intake =	2.08E-08	Cancer Dermal Intake =	5.28E-08
Trespasser:	Noncancer Ingestion Intake =	1.62E-07	Noncancer Dermal Intake =	4.11E-07
Recreational User - Adult:	Cancer Ingestion Intake =	2.54E-08	Cancer Dermal Intake =	1.07E-07
Recreational User - Adult:	Noncancer Ingestion Intake =	8.90E-08	Noncancer Dermal Intake =	3.76E-07
Recreational User - Child:	Cancer Ingestion Intake =	8.14E-08	Cancer Dermal Intake =	1.93E-07
Recreational User - Child:	Noncancer Ingestion Intake =	9.50E-07	Noncancer Dermal Intake =	2.25E-06
Construction/Utility Worker:	Cancer Ingestion Intake =	6.46E-09	Cancer Dermal Intake =	2.07E-08
Construction/Utility Worker:	Noncancer Ingestion Intake =	4.52E-07	Noncancer Dermal Intake =	1.45E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 3-4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS - FUGITIVE DUST AND VOLATILES ORIGINATING FROM SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Soil
Exposure Medium:	Fugitive Dust and Volatiles

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation of fugitive dust and volatiles	Outdoor Worker	Adult	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (ug/m^3) =
				ET	Exposure Time	8	hrs/day	USEPA, 2014	CS x ET x EF x ED x CF2
				EF	Exposure Frequency	250	days/yr	USEPA, 2014	[1/(1/PEF + 1/VF)] x AT x CF1
				ED	Exposure Duration	25	year	USEPA, 2014	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	USEPA, 2002 (9)	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	USEPA, 2020	
				CF1	Conversion Factor 1	24	hrs/day	--	
				CF2	Conversion Factor 2	1000	µg/mg	--	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	9,125	days	USEPA, 1989	
	Hypothetical Future Resident	Adult	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (ug/m^3) =
				ET	Exposure Time	24	hrs/day	USEPA, 2014	CS x ET x EF x ED x CF2
				EF	Exposure Frequency	350	days/yr	USEPA, 2014	[1/(1/PEF + 1/VF)] x AT x CF1
				ED	Exposure Duration	20	years	USEPA, 2014	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	USEPA, 2002 (9)	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	USEPA, 2020	
				CF1	Conversion Factor 1	24	hrs/day	--	
				CF2	Conversion Factor 2	1000	µg/mg	--	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	7,300	days	USEPA, 1989	
		Child	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (ug/m^3) =
				ET	Exposure Time	24	hrs/day	USEPA, 2014	CS x ET x EF x ED x CF2
				EF	Exposure Frequency	350	days/yr	USEPA, 2014	[1/(1/PEF + 1/VF)] x AT x CF1
				ED	Exposure Duration	6	years	USEPA, 2014	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	USEPA, 2002 (9)	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	USEPA, 2020	
				CF1	Conversion Factor 1	24	hrs/day	--	
				CF2	Conversion Factor 2	1000	µg/mg	--	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	2,190	days	USEPA, 1989	

TABLE 3-4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS - FUGITIVE DUST AND VOLATILES ORIGINATING FROM SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Soil
Exposure Medium:	Fugitive Dust and Volatiles

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation of fugitive dust and volatiles	Trespasser	Adolescent (7 to <16 years)	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (ug/m^3) =
				ET	Exposure Time	2	hrs/day	(1)	CS x ET x EF x ED x CF2
				EF	Exposure Frequency	26	days/yr	(2)	[1/(1/PEF + 1/VF)] x AT x CF1
				ED	Exposure Duration	9	years	(3)	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	USEPA, 2002 (9)	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	USEPA, 2020	
				CF1	Conversion Factor 1	24	hrs/day	--	
				CF2	Conversion Factor 2	1,000	µg/mg	--	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	3,285	days	USEPA, 1989	
	Recreational User	Adult	Off-Project Red Maple Swamp/Tidal Stream Area (Walking Path)	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (ug/m^3) =
				ET	Exposure Time	1	hrs/day	(4)	CS x ET x EF x ED x CF2
				EF	Exposure Frequency	26	days/yr	(2)	[1/(1/PEF + 1/VF)] x AT x CF1
				ED	Exposure Duration	20	years	USEPA, 2014 (5)	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	USEPA, 2002 (9)	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	USEPA, 2020	
				CF1	Conversion Factor 1	24	hrs/day	--	
				CF2	Conversion Factor 2	1,000	µg/mg	--	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	7,300	days	USEPA, 1989	
		Child	Off-Project Red Maple Swamp/Tidal Stream Area (Walking Path)	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (ug/m^3) =
				ET	Exposure Time	1	hrs/day	(4)	CS x ET x EF x ED x CF2
				EF	Exposure Frequency	26	days/yr	(2)	[1/(1/PEF + 1/VF)] x AT x CF1
				ED	Exposure Duration	6	years	USEPA, 2014 (6)	
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	USEPA, 2002 (9)	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	USEPA, 2020	
				CF1	Conversion Factor 1	24	hrs/day	--	
				CF2	Conversion Factor 2	1,000	µg/mg	--	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	2,190	days	USEPA, 1989	

TABLE 3-4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS - FUGITIVE DUST AND VOLATILES ORIGINATING FROM SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Soil
Exposure Medium:	Fugitive Dust and Volatiles

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation of fugitive dust and volatiles	Construction/Utility Worker	Adult	On-Project Blue Beach Area	CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	--	Intake (ug/m^3) =
				ET	Exposure Time	10	hrs/day	(7)	CS x ET x EF x ED x CF2
				EF	Exposure Frequency	40	days/yr	(8)	[1/(1/PEF + 1/VF)] x AT x CF1
				ED	Exposure Duration	1	year	USEPA, 2002	
				PEF	Particulate Emission Factor	7.74E+05	m^3/kg	USEPA, 2002 (10)	
				VF	Volatilization Factor	Chemical Specific	m^3/kg	USEPA, 2020	
				CF1	Conversion Factor 1	24	hrs/day	--	
				CF2	Conversion Factor 2	1000	µg/mg	--	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	365	days	USEPA, 1989	

Notes:

< = Less than.

USEPA = United States Environmental Protection Agency.

(1) Assumes a trespasser accesses the area for 2 hours per event. Equals the mean time spent outdoors for ages 6 to 16 years (USEPA, 2004, Table 16-1).

(2) Assumes access to soils in the area may occur 1 day per week for 26 weeks (6 months) of the year, based on professional judgment.

(3) Exposure duration reflects age-range of 7 to <16 years.

(4) Assumes recreational users may be exposed to fugitive dust while wading in the off-Project Red Maple Swamp/tidal stream once per day, based on professional judgment.

(5) Default value for adult resident; assumes an adult recreational user accesses the area for 20 years.

(6) Default value for child resident; assumes a child recreational user accesses the area for 6 years.

(7) Conservatively assumes a 10-hour work day, based on professional judgement.

(8) Construction/utility activities are assumed to occur for 40 days over the course of a 1 year period (for RME scenario), based on professional judgment.

(9) Default particulate emission factor for a non-excavation scenario (Equation B-8; USEPA, 2002).

(10) Default subchronic particulate emission factor for unpaved road traffic (Equation E-18; USEPA, 2002).

Sources:

USEPA, 1989. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. December 2002.

USEPA, 2004. Risk Assessment Guidance for Superfund. Part E, Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

USEPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. February 6, 2014. Revised September 2015.

USEPA, 2020. Regional Screening Level Calculator (May 2020).

TABLE 3-4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS - FUGITIVE DUST AND VOLATILES ORIGINATING FROM SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Soil
Exposure Medium:	Fugitive Dust and Volatiles

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

Unit Intake Calculations

Inhalation Intake [(ug/m^3)(kg/mg)] = (ET x EF x ED x CF2)/(AT x CF1) [CS, PEF and VF are factored into the risk calculation in Table 7s]

Outdoor Worker:	Cancer Inhalation Intake =	8.15E+01
Outdoor Worker:	Noncancer Inhalation Intake =	2.28E+02
Resident - Adult:	Cancer Inhalation Intake =	2.74E+02
Resident - Adult:	Noncancer Inhalation Intake =	9.59E+02
Resident - Child:	Cancer Inhalation Intake =	8.22E+01
Resident - Child:	Noncancer Inhalation Intake =	9.59E+02
Trespasser:	Cancer Inhalation Intake =	7.63E-01
Trespasser:	Noncancer Inhalation Intake =	5.94E+00
Recreational User - Adult:	Cancer Inhalation Intake =	8.48E-01
Recreational User - Adult:	Noncancer Inhalation Intake =	2.97E+00
Recreational User - Child:	Cancer Inhalation Intake =	2.54E-01
Recreational User - Child:	Noncancer Inhalation Intake =	2.97E+00
Construction/Utility Worker:	Cancer Inhalation Intake =	6.52E-01
Construction/Utility Worker:	Noncancer Inhalation Intake =	4.57E+01

Cancer risk from inhalation = Soil concentration x Cancer Inhalation Intake x Inhalation Unit Risk

Hazard Index from inhalation = Soil concentration x Noncancer Inhalation Intake / Inhalation Reference Concentration

TABLE 3-4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS - GROUNDWATER

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Hypothetical Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Hypothetical Future Resident	Adult	On-Project Blue Beach Area	CW	Chemical Concentration in Water	Chemical Specific	ug/L	--	Intake (mg/kg-day) =
				IR	Ingestion Rate	2.5	liters/day	USEPA, 2014	CW x IR x EF x ED x CF
				EF	Exposure Frequency	350	days/yr	USEPA, 2014	BW x AT
				ED	Exposure Duration	20	years	USEPA, 2014	
				CF	Conversion Factor	0.001	mg/ug	--	
				BW	Body Weight	80	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	7,300	days	USEPA, 1989	
		Child	On-Project Blue Beach Area	CW	Chemical Concentration in Water	Chemical Specific	ug/L	--	Intake (mg/kg-day) =
				IR	Ingestion Rate	0.78	liters/day	USEPA, 2014	CW x IR x EF x ED x CF
				EF	Exposure Frequency	350	days/yr	USEPA, 2014	BW x AT
				ED	Exposure Duration	6	years	USEPA, 2014	
				CF	Conversion Factor	0.001	mg/ug	--	
				BW	Body Weight	15	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	2,190	days	USEPA, 1989	

TABLE 3-4.3
VALUES USED FOR DAILY INTAKE CALCULATIONS - GROUNDWATER
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Hypothetical Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Hypothetical Future Resident	Adult	On-Project Blue Beach Area	CW	Chemical Concentration in Water	Chemical Specific	ug/L	--	Organics:
(showering/bathing)				DA	Dose Absorbed per Unit Area per Event	Chemical Specific	mg/cm^2-event	--	Intake (mg/kg-day) =
				SA	Surface Area	19,652	cm^2	USEPA, 2014	
				PC	Permeability Constant	Chemical Specific	cm/hr	See Attachment E-1	DA x SA x EV x EF x ED x CF1 x CF2
				ET	Event Time	0.71	hour/event	USEPA, 2014	BW x AT
				EV	Event Frequency	1	event/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2014	
				ED	Exposure Duration	20	years	USEPA, 2014	Inorganics:
				BW	Body Weight	80	kg	USEPA, 2014	Intake (mg/kg-day) =
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	CW x SA x PC x ET x EV x EF x ED x CF1 x CF2
				ATnc	Averaging Time - noncancer	7,300	days	USEPA, 1989	BW x AT
				CF1	Conversion Factor 1	0.001	L/cm^3	--	
				CF2	Conversion Factor 2	0.001	mg/ug	--	
		Child	On-Project Blue Beach Area	CW	Chemical Concentration in Water	Chemical Specific	ug/L	--	Organics:
				DA	Dose Absorbed per Unit Area per Event	Chemical Specific	mg/cm^2-event	--	Intake (mg/kg-day) =
				SA	Surface Area	6,365	cm^2	USEPA, 2014	
				PC	Permeability Constant	Chemical Specific	cm/hr	See Attachment E-1	DA x SA x EV x EF x ED
				ET	Event Time	0.54	hour/event	USEPA, 2014	BW x AT
				EV	Event Frequency	1	event/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/yr	USEPA, 2014	
				ED	Exposure Duration	6	years	USEPA, 2014	Inorganics:
				BW	Body Weight	15	kg	USEPA, 2014	Intake (mg/kg-day) =
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	CW x SA x PC x ET x EV x EF x ED x CF1 x CF2
				ATnc	Averaging Time - noncancer	2,190	days	USEPA, 1989	BW x AT
				CF1	Conversion Factor 1	0.001	L/cm^3	--	
				CF2	Conversion Factor 2	0.001	mg/ug	--	

TABLE 3-4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS - GROUNDWATER

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Hypothetical Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

Notes:

USEPA = United States Environmental Protection Agency.

Sources:

USEPA, 1989. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. February 6, 2014. Revised September 2015.

Unit Intake Calculations

Incidental Ingestion Intake [(mg/kg-day)(L/ug)]= (IR x EF x ED x CF)/(BW x AT) [CW is factored into the risk calculation in Table 7s]

Dermal Intake [(mg/kg-day)(L/ug)(event/cm)]= (SA x EV x EF x ED x CF1 x CF2)/(BW x AT) [DA (including CW, PC, and ET) is factored into the risk calculation in Table 7s]

Resident - Adult:	Cancer Ingestion Intake =	8.56E-06	Cancer Dermal Intake =	6.73E-05
Resident - Adult:	Noncancer Ingestion Intake =	3.00E-05	Noncancer Dermal Intake =	2.36E-04
Resident - Child:	Cancer Ingestion Intake =	4.27E-06	Cancer Dermal Intake =	3.49E-05
Resident - Child:	Noncancer Ingestion Intake =	4.99E-05	Noncancer Dermal Intake =	4.07E-04

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 3-4.4

VALUES USED FOR DAILY INTAKE CALCULATIONS - SHOWER AIR

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Hypothetical Future
Medium:	Groundwater
Exposure Medium:	Shower Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation (showering/bathing)	Hypothetical Future Resident	Adult	On-Project Blue Beach Area	CA	Chemical Concentration in Shower Air	Chemical Specific	ug/m^3	--	Intake (ug/m^3) = $\frac{CA \times ET \times EF \times ED}{AT \times CF}$
				ET	Exposure Time	1.01	hrs/day	USEPA, 2011 (1)	
				EF	Exposure Frequency	350	days/yr	USEPA, 2014	
				ED	Exposure Duration	20	years	USEPA, 2014	
				CF	Conversion Factor	24	hrs/day	--	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	7,300	days	USEPA, 1989	
		Child	On-Project Blue Beach Area	CS	Chemical Concentration in Shower Air	Chemical Specific	ug/m^3	--	Intake (ug/m^3) = $\frac{CA \times ET \times EF \times ED}{AT \times CF}$
				ET	Exposure Time	0.69	hrs/day	USEPA, 2011 (1)	
				EF	Exposure Frequency	350	days/yr	USEPA, 2014	
				ED	Exposure Duration	6	years	USEPA, 2014	
				CF	Conversion Factor	24	hrs/day	--	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	2,190	days	USEPA, 1989	

Notes:

USEPA = United States Environmental Protection Agency.

(1) Based on time spent in bathroom during and following bathing/showering. Based on weighted 90th percentile values presented in Table 16-29 of the USEPA Exposure Factors Handbook (2011).

Sources:

USEPA, 1989. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2011. Exposure Factors Handbook. September 2011.

USEPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. February 6, 2014. Revised September 2015.

Unit Intake Calculations

Inhalation Intake (unitless) = (ET x EF x ED)/(AT x CF) [CA is factored into the risk calculation in Table 7s]

Resident - Adult:	Cancer Inhalation Intake =	1.15E-02
Resident - Adult:	Noncancer Inhalation Intake =	4.04E-02
Resident - Child:	Cancer Inhalation Intake =	2.36E-03
Resident - Child:	Noncancer Inhalation Intake =	2.76E-02

Cancer risk from inhalation = Air concentration x Cancer Inhalation Intake x Inhalation Unit Risk

Hazard Index from inhalation = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Concentration

TABLE 3-4.5

VALUES USED FOR DAILY INTAKE CALCULATIONS - SHALLOW GROUNDWATER

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Shallow Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Incidental Ingestion	Construction/Utility Worker	Adult	On-Project Blue Beach Area	CW	Chemical Concentration in Water	Chemical Specific	ug/L	--	Intake (mg/kg-day) =
				IR	Ingestion Rate	0.005	liters/day	USEPA, 1989; USEPA, 2011 (1)	$\frac{CW \times IR \times EF \times ED \times CF}{BW \times AT}$
				EF	Exposure Frequency	40	days/yr	(2)	
				ED	Exposure Duration	1	years	USEPA, 2002	
				CF	Conversion Factor	0.001	mg/ug	--	
				BW	Body Weight	80	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	365	days	USEPA, 1989	
Dermal	Construction/Utility Worker	Adult	On-Project Blue Beach Area	CW	Chemical Concentration in Water	Chemical Specific	ug/L	--	Organics:
				DA	Dose Absorbed per Unit Area per Event	Chemical Specific	mg/cm^2-event	--	Intake (mg/kg-day) =
				SA	Surface Area	3,527	cm^2	USEPA, 2014	
				PC	Permeability Constant	Chemical Specific	cm/hr	See Attachment E-1	$\frac{DA \times SA \times EV \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
				ET	Event Time	10	hour/event	(3)	
				EV	Event Frequency	1	event/day	USEPA, 2004	
				EF	Exposure Frequency	40	days/yr	(2)	
				ED	Exposure Duration	1	years	USEPA, 2002	Inorganics:
				BW	Body Weight	80	kg	USEPA, 2014	Intake (mg/kg-day) =
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	$\frac{CW \times SA \times PC \times ET \times EV \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
				ATnc	Averaging Time - noncancer	365	days	USEPA, 1989	
				CF1	Conversion Factor 1	0.001	L/cm^3	--	
				CF2	Conversion Factor 2	0.001	mg/ug	--	

TABLE 3-4.5

VALUES USED FOR DAILY INTAKE CALCULATIONS - SHALLOW GROUNDWATER

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Shallow Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

Notes:

USEPA = United States Environmental Protection Agency.

(1) Based on professional judgment and USEPA guidance (1989 and 2011). Value is one-tenth of that assumed to occur during a swimming event via incidental ingestion. Assumes groundwater is not used for drinking water.

(2) Construction/utility activities are assumed to occur for 40 days over the course of a 1 year period (for RME scenario), based on professional judgment.

(3) Conservatively assumes contact with groundwater in an excavation trench occurs for a 10-hour work day, based on professional judgement.

Sources:

USEPA, 1989. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. December 2002.

USEPA, 2004. Risk Assessment Guidance for Superfund. Part E, Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

USEPA, 2011. Exposure Factors Handbook. September 2011.

USEPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. February 6, 2014. Revised September 2015.

Unit Intake Calculations

Incidental Ingestion Intake [(mg/kg-day)(L/ug)]= (IR x EF x ED x CF)/(BW x AT) [CW is factored into the risk calculation in Table 7s]

Dermal Intake [(mg/kg-day)(L/ug)(event/cm)]= (SA x EV x EF x ED x CF1 x CF2)/(BW x AT) [DA (including CW, PC, and ET) is factored into the risk calculation in Table 7s]

Construction/Utility Worker:	Cancer Ingestion Intake =	9.78E-11	Cancer Dermal Intake =	6.90E-08
Construction/Utility Worker:	Noncancer Ingestion Intake =	6.85E-09	Noncancer Dermal Intake =	4.83E-06

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 3-4.6

VALUES USED FOR DAILY INTAKE CALCULATIONS - TRENCH AIR

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Groundwater
Exposure Medium:	Trench Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation of volatiles	Construction/Utility Worker	Adult	On-Project Blue Beach Area	CA	Chemical Concentration in Trench Air	Chemical Specific	ug/m^3	--	Intake (ug/m^3) =
				ET	Exposure Time	10	hrs/day	(1)	$\frac{CA \times ET \times EF \times ED}{AT \times CF}$
				EF	Exposure Frequency	40	days/yr	(2)	
				ED	Exposure Duration	1	year	USEPA, 2002	
				CF	Conversion Factor	24	hrs/day	--	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	365	days	USEPA, 1989	

Notes:

USEPA = United States Environmental Protection Agency.

(1) Conservatively assumes contact with volatiles in an excavation trench occurs for a 10-hour work day, based on professional judgement.

(2) Construction/utility activities are assumed to occur for 40 days over the course of a 1 year period (for RME scenario), based on professional judgment.

Sources:

USEPA, 1989. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. December 2002.

Unit Intake Calculations

Inhalation Intake (unitless) = (ET x EF x ED)/(AT x CF) [CA is factored into the risk calculation in Table 7s]

Construction/Utility Worker:	Cancer Inhalation Intake =	6.52E-04
Construction/Utility Worker:	Noncancer Inhalation Intake =	4.57E-02

Cancer risk from inhalation = Air concentration x Cancer Inhalation Intake x Inhalation Unit Risk

Hazard Index from inhalation = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Concentration

TABLE 3-4.7

VALUES USED FOR DAILY INTAKE CALCULATIONS - SEDIMENT AND HYDRIC SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Sediment; Hydric Soil
Exposure Medium:	Sediment; Hydric Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point(s)	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Incidental Ingestion	Recreational User	Adult	Off-Project Red Maple Swamp/Tidal Stream Area	CS	Chemical Concentration in Sediment/Hydric Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				IR	Ingestion Rate	10	mg/day	(1)	$\frac{CS \times IR \times EF \times ED \times CF \times FI \times RBA}{BW \times AT}$
				EF	Exposure Frequency	26	days/yr	(2)	
				ED	Exposure Duration	20	years	USEPA, 2014	
				FI	Fraction Ingested from Site	1	unitless	(3)	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				RBA	Relative Bioavailability Factor	0.6 (Arsenic only) / 1	unitless	USEPA, 2012	
				BW	Body Weight	80	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	7,300	days	USEPA, 1989	
		Child	Off-Project Red Maple Swamp/Tidal Stream Area	CS	Chemical Concentration in Sediment/Hydric Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				IR	Ingestion Rate	20	mg/day	(1)	$\frac{CS \times IR \times EF \times ED \times CF \times FI \times RBA}{BW \times AT}$
				EF	Exposure Frequency	26	days/yr	(2)	
				ED	Exposure Duration	6	years	USEPA, 2014	
				FI	Fraction Ingested from Site	1	unitless	(3)	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				RBA	Relative Bioavailability Factor	0.6 (Arsenic only) / 1	unitless	USEPA, 2012	
				BW	Body Weight	15	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	2,190	days	USEPA, 1989	

TABLE 3-4.7

VALUES USED FOR DAILY INTAKE CALCULATIONS - SEDIMENT AND HYDRIC SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Sediment; Hydric Soil
Exposure Medium:	Sediment; Hydric Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point(s)	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational User	Adult	Off-Project Red Maple Swamp/Tidal Stream Area	CS	Chemical Concentration in Sediment/Hydric Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				SA	Surface Area	6,032	cm^2	USEPA, 2014 (7)	CS x SA x AF x ABS x EV x EF x ED x CF
				AF	Adherence Factor	0.07	mg/cm^2-event	(5)	BW x AT
				ABS	Dermal absorption fraction	Chemical Specific	unitless	See Attachment E-1	
				EV	Event Frequency	1	event/day	(6)	
				EF	Exposure Frequency	26	days/yr	(2)	
				ED	Exposure Duration	20	years	USEPA, 2014	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				BW	Body Weight	80	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	7,300	days	USEPA, 1989	
		Child	Off-Project Red Maple Swamp/Tidal Stream Area	CS	Chemical Concentration in Sediment/Hydric Soil	Chemical Specific	mg/kg	--	Intake (mg/kg-day) =
				SA	Surface Area	2,373	cm^2	USEPA, 2014 (8)	CS x SA x AF x ABS x EV x EF x ED x CF
				AF	Adherence Factor	0.2	mg/cm^2-event	USEPA, 2004 (4)	BW x AT
				ABS	Dermal absorption fraction	Chemical Specific	unitless	See Attachment E-1	
				EV	Event Frequency	1	event/day	(6)	
				EF	Exposure Frequency	26	days/yr	(2)	
				ED	Exposure Duration	6	years	USEPA, 2014	
				CF	Conversion Factor	1.00E-06	kg/mg	--	
				BW	Body Weight	15	kg	USEPA, 2014	
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	2,190	days	USEPA, 1989	

TABLE 3-4.7

VALUES USED FOR DAILY INTAKE CALCULATIONS - SEDIMENT AND HYDRIC SOIL

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future; Future
Medium:	Sediment; Hydric Soil
Exposure Medium:	Sediment; Hydric Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point(s)	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

Notes:

< = Less than.

USEPA = United States Environmental Protection Agency.

(1) Assumes the incidental ingestion rate for sediment/hydric soil is 10 percent of the soil ingestion rate recommended by USEPA (2014).

(2) Assumes access to sediment/hydric soil in the area may occur 1 day per week for 26 weeks (6 months) of the year, based on professional judgment.

(3) Professional judgment; conservatively assumes 100 percent of sediment/hydric soil ingested is from the associated area.

(4) Represents the geometric mean weighted value for children playing in wet soil (USEPA, 2004; Exhibit 3-3). Equal to the USEPA default surface area for contact with soil by a residential child (USEPA, 2014).

(5) Represents the geometric mean weighted value for residential gardeners (USEPA, 2004; Exhibit 3-3). Equal to the USEPA default soil adherence factor for a residential adult (USEPA, 2014).

(6) Professional judgment; assumes one event per day.

(7) Represents the weighted mean surface area for male and female adults, including head, hands, forearms, and lower legs (USEPA, 2011; Table 7-2).

(8) Represents the weighted mean surface area for males and females ages 0 to <6 years old, including head, hands, forearms, lower legs, and feet (USEPA, 2011; Table 7-2). Equal to the USEPA default surface area for contact with soil by a residential child (USEPA, 2014).

Sources:

USEPA, 1989. Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2004. Risk Assessment Guidance for Superfund. Part E, Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

USEPA, 2011. Exposure Factors Handbook. September 2011.

USEPA, 2012. Recommendations for default value for relative bioavailability of arsenic in soil. OSWER Directive 9200.1-113. December 2012.

USEPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. February 6, 2014. Revised September 2015.

Unit Intake Calculations

Incidental Ingestion Intake [(mg/kg-day)(kg/mg)] = (IR x EF x ED x CF x FI))/(BW x AT) [CS and RBA are factored into the risk calculation in Table 7s]

Dermal Intake [(mg/kg-day)(kg/mg)] = (SA x AF x EV x EF x ED x CF)/(BW x AT) [CS and ABS are factored into the risk calculation in Table 7s]

Recreational User - Adult:	Cancer Ingestion Intake =	2.54E-09	Cancer Dermal Intake =	1.07E-07
Recreational User - Adult:	Noncancer Ingestion Intake =	8.90E-09	Noncancer Dermal Intake =	3.76E-07
Recreational User - Child:	Cancer Ingestion Intake =	8.14E-09	Cancer Dermal Intake =	1.93E-07
Recreational User - Child:	Noncancer Ingestion Intake =	9.50E-08	Noncancer Dermal Intake =	2.25E-06

Cancer risk from ingestion = Sediment concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Sediment concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Sediment concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Sediment concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 3-4.8

VALUES USED FOR DAILY INTAKE CALCULATIONS - SURFACE WATER

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational User (Wading Scenario)	Adult	Off-Project Red Maple Swamp/Tidal Stream Area	CW	Chemical Concentration in Water	Chemical Specific	ug/L	--	Organics:
				DA	Dose Absorbed per Unit Area per Event	Chemical Specific	mg/cm^2-event	--	Intake (mg/kg-day) =
				SA	Surface Area	6,032	cm^2	(3)	
				PC	Permeability Constant	Chemical Specific	cm/hr	See Attachment E-1	$\frac{DA \times SA \times EV \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
				ET	Event Time	1	hour/event	(1)	
				EV	Event Frequency	1	event/day	USEPA, 2004	
				EF	Exposure Frequency	26	days/yr	(2)	
				ED	Exposure Duration	20	years	USEPA, 2014	Inorganics:
				BW	Body Weight	80	kg	USEPA, 2014	$\frac{CW \times SA \times PC \times ET \times EV \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	7,300	days	USEPA, 1989	
				CF1	Conversion Factor 1	0.001	L/cm^3	--	
				CF2	Conversion Factor 2	0.001	mg/ug	--	
		Child	Off-Project Red Maple Swamp/Tidal Stream Area	CW	Chemical Concentration in Water	Chemical Specific	ug/L	--	Organics:
				DA	Dose Absorbed per Unit Area per Event	Chemical Specific	mg/cm^2-event	--	Intake (mg/kg-day) =
				SA	Surface Area	2,373	cm^2	(3)	
				PC	Permeability Constant	Chemical Specific	cm/hr	See Attachment E-1	$\frac{DA \times SA \times EV \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
				ET	Event Time	1	hour/event	(1)	
				EV	Event Frequency	1	event/day	USEPA, 2004	
				EF	Exposure Frequency	26	days/yr	(2)	
				ED	Exposure Duration	6	years	USEPA, 2014	Inorganics:
				BW	Body Weight	15	kg	USEPA, 2014	$\frac{CW \times SA \times PC \times ET \times EV \times EF \times ED \times CF1 \times CF2}{BW \times AT}$
				ATc	Averaging Time - cancer	25,550	days	USEPA, 1989	
				ATnc	Averaging Time - noncancer	2,190	days	USEPA, 1989	
				CF1	Conversion Factor 1	0.001	L/cm^3	--	
				CF2	Conversion Factor 2	0.001	mg/ug	--	

TABLE 3-4.8

VALUES USED FOR DAILY INTAKE CALCULATIONS - SURFACE WATER

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe:	Current/Future
Medium:	Surface Water
Exposure Medium:	Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name

Notes:

N/A = Not applicable.

USEPA = United States Environmental Protection Agency.

(1) Assumes contact with surface water for 1 hour on each day exposure occurs.

(2) Assumes access to surface water in the area may occur 1 day per week for 26 weeks (6 months) of the year, based on professional judgment.

(3) The body surface area assumed to contact surface water during wading activities is assumed to be the same as is recommended for soil (USEPA, 2014).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

USEPA, 2014: Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. February 6, 2014. Corrected February 2015.

Unit Intake Calculations

Incidental Ingestion Intake [(mg/kg-day)(L/ug)]= (IR x EF x ED x CF)/(BW x AT) [CW is factored into the risk calculation in Table 7s]

Dermal Intake [(mg/kg-day)(L/ug)(event/cm)]= (SA x EV x EF x ED x CF1 x CF2)/(BW x AT) [DA (including CW, PC, and ET) is factored into the risk calculation in Table 7s]

Recreational User - Adult (Wading):	Cancer Ingestion Intake =	N/A	Cancer Dermal Intake =	1.53E-06
Recreational User - Adult (Wading):	Noncancer Ingestion Intake =	N/A	Noncancer Dermal Intake =	5.37E-06
Recreational User - Child (Wading):	Cancer Ingestion Intake =	N/A	Cancer Dermal Intake =	9.66E-07
Recreational User - Child (Wading):	Noncancer Ingestion Intake =	N/A	Noncancer Dermal Intake =	1.13E-05

Cancer risk from ingestion = Surface water concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Surface water concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Surface water concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Surface water concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 3-5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern (1)	CAS Number	Chronic/ Subchronic (2)	Oral RfD		Oral Absorption Efficiency for Dermal (3)	Absorbed RfD for Dermal (5)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
			Value	Units		Value	Units			Source(s)	Date(s) (6) (MM/YYYY)
CHRONIC TOXICITY VALUES											
Inorganics											
Aluminum	7429-90-5	Chronic	1.0E+00	mg/kg-day	(4)	1.0E+00	mg/kg-day	Nervous, Developmental	100	PPRTV	9/2020
Antimony	7440-36-0	Chronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Mortality, Blood	1,000	IRIS	9/2020
Arsenic	7440-38-2	Chronic	3.0E-04	mg/kg-day	(4)	3.0E-04	mg/kg-day	Skin, Vascular	3	IRIS	9/2020
Barium	7440-39-3	Chronic	2.0E-01	mg/kg-day	0.07	1.4E-02	mg/kg-day	Kidney	300	IRIS	9/2020
Cadmium (water)	7440-43-9	Chronic	5.0E-04	mg/kg-day	0.05	2.5E-05	mg/kg-day	Kidney	10	IRIS	9/2020
Cadmium (other media)	7440-43-9	Chronic	1.0E-03	mg/kg-day	0.025	2.5E-05	mg/kg-day	Kidney	10	IRIS	9/2020
Chromium	7440-47-3	Chronic	1.5E+00	mg/kg-day	0.013	2.0E-02	mg/kg-day	None reported	100	IRIS	9/2020
Cobalt	7440-48-4	Chronic	3.0E-04	mg/kg-day	(4)	3.0E-04	mg/kg-day	Thyroid	3,000	PPRTV	9/2020
Copper	7440-50-8	Chronic	4.0E-02	mg/kg-day	(4)	4.0E-02	mg/kg-day	Gastrointestinal	N/A	HEAST	7/1997
Iron	7439-89-6	Chronic	7.0E-01	mg/kg-day	(4)	7.0E-01	mg/kg-day	Gastrointestinal	1.5	PPRTV	9/2020
Lead	7439-92-1	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese	7439-96-5	Chronic	2.4E-02	mg/kg-day	0.04	9.6E-04	mg/kg-day	Nervous	3	IRIS	9/2020
Thallium	7440-28-0	Chronic	1.0E-05	mg/kg-day	(4)	1.0E-05	mg/kg-day	Hair, Skin	3,000	PPRTV Appendix	9/2020
Vanadium	7440-62-2	Chronic	5.0E-03	mg/kg-day	0.026	1.3E-04	mg/kg-day	Hair	100	IRIS	9/2020
PCBs											
Total PCB Aroclors	Tot-PCB-ARO	Chronic	2.0E-05	mg/kg-day	(4)	2.0E-05	mg/kg-day	Eye, Nails, Immune	300	IRIS	9/2020
SVOCs											
1-Methylnaphthalene	90-12-0	Chronic	7.0E-02	mg/kg-day	(4)	7.0E-02	mg/kg-day	Respiratory	1,000	ATSDR	8/2020
2-Methylnaphthalene	91-57-6	Chronic	4.0E-03	mg/kg-day	(4)	4.0E-03	mg/kg-day	Respiratory	1,000	IRIS	9/2020
Benzo(a)anthracene	56-55-3	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)Pyrene	50-32-8	Chronic	3.0E-04	mg/kg-day	(4)	3.0E-04	mg/kg-day	Developmental	300	IRIS	9/2020
Benzo(b)fluoranthene	205-99-2	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	53-70-3	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Indeno(1,2,3-CD)Pyrene	193-39-5	Chronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Naphthalene	91-20-3	Chronic	2.0E-02	mg/kg-day	(4)	2.0E-02	mg/kg-day	Body weight	3,000	IRIS	9/2020
VOCs											
1,1,2,2-Tetrachloroethane	79-34-5	Chronic	2.0E-02	mg/kg-day	(4)	2.0E-02	mg/kg-day	Liver	1,000	IRIS	9/2020
1,1,2-Trichloroethane	79-00-5	Chronic	4.0E-03	mg/kg-day	(4)	4.0E-03	mg/kg-day	Immune, Blood	1,000	IRIS	9/2020
1,1-Dichloroethane	75-34-3	Chronic	2.0E-01	mg/kg-day	(4)	2.0E-01	mg/kg-day	Kidney	3,000	PPRTV	9/2020
1,2,3-Trichlorobenzene	87-61-6	Chronic	8.0E-04	mg/kg-day	(4)	8.0E-04	mg/kg-day	Liver, Thyroid, Reduced body weight	10,000	PPRTV Appendix	9/2020
1,2,4-Trimethylbenzene	95-63-6	Chronic	1.0E-02	mg/kg-day	(4)	1.0E-02	mg/kg-day	Nervous	300	IRIS	9/2020
1,2-Dichloropropane	78-87-5	Chronic	4.0E-02	mg/kg-day	(4)	4.0E-02	mg/kg-day	Musculoskeletal	30	PPRTV	9/2020
Benzene	71-43-2	Chronic	4.0E-03	mg/kg-day	(4)	4.0E-03	mg/kg-day	Immune	300	IRIS	9/2020

TABLE 3-5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern (1)	CAS Number	Chronic/ Subchronic (2)	Oral RfD		Oral Absorption Efficiency for Dermal (3)	Absorbed RfD for Dermal (5)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
			Value	Units		Value	Units			Source(s)	Date(s) (6) (MM/YYYY)
Chloroform	67-66-3	Chronic	1.0E-02	mg/kg-day	(4)	1.0E-02	mg/kg-day	Liver	100	IRIS	9/2020
cis-1,2-Dichloroethene	156-59-2	Chronic	2.0E-03	mg/kg-day	(4)	2.0E-03	mg/kg-day	Kidney	3,000	IRIS	9/2020
n-Heptane	142-82-5	Chronic	3.0E-04	mg/kg-day	(4)	3.0E-04	mg/kg-day	Gastrointestinal	10,000	PPRTV Appendix	9/2020
Ethylbenzene	100-41-4	Chronic	1.0E-01	mg/kg-day	(4)	1.0E-01	mg/kg-day	Liver, Kidney	1,000	IRIS	9/2020
Tetrachloroethene	127-18-4	Chronic	6.0E-03	mg/kg-day	(4)	6.0E-03	mg/kg-day	Nervous, Eye	1,000	IRIS	9/2020
Total Xylenes	Tot-Xylenes	Chronic	2.0E-01	mg/kg-day	(4)	2.0E-01	mg/kg-day	Decreased body weight, Increased mortality	1,000	IRIS	9/2020
Trichloroethylene	79-01-6	Chronic	5.0E-04	mg/kg-day	(4)	5.0E-04	mg/kg-day	Developmental, Immune	10, 100, 1000	IRIS	9/2020
Vinyl Chloride	75-01-4	Chronic	3.0E-03	mg/kg-day	(4)	3.0E-03	mg/kg-day	Liver	30	IRIS	9/2020
SUBCHRONIC TOXICITY VALUES											
Inorganics											
Aluminum	7429-90-5	Subchronic	1.0E+00	mg/kg-day	(4)	1.0E+00	mg/kg-day	Nervous	30	ATSDR	8/2020
Antimony	7440-36-0	Subchronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Mortality, Blood	1,000	PPRTV	9/2020
Arsenic	7440-38-2	(a)	3.0E-04	mg/kg-day	(4)	3.0E-04	mg/kg-day	Skin, Vascular	3	IRIS	9/2020
Barium	7440-39-3	Subchronic	2.0E-01	mg/kg-day	0.07	1.4E-02	mg/kg-day	Kidney	300	ATSDR	8/2020
Cadmium (water)	7440-43-9	Subchronic	5.0E-04	mg/kg-day	0.05	2.5E-05	mg/kg-day	Musculoskeletal	100	ATSDR	8/2020
Cadmium (other media)	7440-43-9	(a)	1.0E-03	mg/kg-day	0.025	2.5E-05	mg/kg-day	Kidney	10	IRIS	9/2020
Chromium	7440-47-3	(a)	1.5E+00	mg/kg-day	0.013	2.0E-02	mg/kg-day	None reported	100	IRIS	9/2020
Cobalt	7440-48-4	Subchronic	3.0E-03	mg/kg-day	(4)	3.0E-03	mg/kg-day	Thyroid	300	PPRTV	9/2020
Copper	7440-50-8	Subchronic	1.0E-02	mg/kg-day	(4)	1.0E-02	mg/kg-day	Gastrointestinal	3	ATSDR	8/2020
Iron	7439-89-6	Subchronic	7.0E-01	mg/kg-day	(4)	7.0E-01	mg/kg-day	Gastrointestinal	1.5	PPRTV	9/2020
Lead	7439-92-1	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese	7439-96-5	(a)	2.4E-02	mg/kg-day	0.04	9.6E-04	mg/kg-day	Nervous	3	IRIS	9/2020
Thallium	7440-28-0	Subchronic	4.0E-05	mg/kg-day	(4)	4.0E-05	mg/kg-day	Hair, Skin	1,000	PPRTV Appendix	9/2020
Vanadium	7440-62-2	Subchronic	1.0E-02	mg/kg-day	0.026	2.6E-04	mg/kg-day	Blood	10	ATSDR	8/2020
PCBs											
Total PCB Aroclors	Tot-PCB-ARO	Subchronic	3.0E-05	mg/kg-day	(4)	3.0E-05	mg/kg-day	Nervous	300	ATSDR	8/2020
SVOCs											
1-Methylnaphthalene	90-12-0	(a)	7.0E-02	mg/kg-day	(4)	7.0E-02	mg/kg-day	Respiratory	1,000	ATSDR	8/2020
2-Methylnaphthalene	91-57-6	(a)	4.0E-03	mg/kg-day	(4)	4.0E-03	mg/kg-day	Respiratory	1,000	IRIS	9/2020
Benzo(a)anthracene	56-55-3	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)Pyrene	50-32-8	(a)	3.0E-04	mg/kg-day	(4)	3.0E-04	mg/kg-day	Developmental	300	IRIS	9/2020
Benzo(b)fluoranthene	205-99-2	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	53-70-3	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Indeno(1,2,3-CD)Pyrene	193-39-5	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Naphthalene	91-20-3	Subchronic	6.0E-01	mg/kg-day	(4)	6.0E-01	mg/kg-day	Nervous	90	ATSDR	8/2020

TABLE 3-5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern (1)	CAS Number	Chronic/ Subchronic (2)	Oral RfD		Oral Absorption Efficiency for Dermal (3)	Absorbed RfD for Dermal (5)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
			Value	Units		Value	Units			Source(s)	Date(s) (6) (MM/YYYY)
VOCs											
1,1,2,2-Tetrachloroethane	79-34-5	Subchronic	5.0E-02	mg/kg-day	(4)	5.0E-02	mg/kg-day	Liver	300	IRIS	9/2020
1,1,2-Trichloroethane	79-00-5	Subchronic	4.0E-03	mg/kg-day	(4)	4.0E-03	mg/kg-day	Liver, Immune	1,000	PPRTV	9/2020
1,1-Dichloroethane	75-34-3	Subchronic	2.0E+00	mg/kg-day	(4)	2.0E+00	mg/kg-day	Kidney	300	PPRTV	9/2020
1,2,3-Trichlorobenzene	87-61-6	Subchronic	8.0E-03	mg/kg-day	(4)	8.0E-03	mg/kg-day	Liver, Thyroid, Reduced body weight	1,000	PPRTV	9/2020
1,2,4-Trimethylbenzene	95-63-6	Subchronic	4.0E-02	mg/kg-day	(4)	4.0E-02	mg/kg-day	Nervous	100	IRIS	9/2020
1,2-Dichloropropane	78-87-5	Subchronic	4.0E-02	mg/kg-day	(4)	4.0E-02	mg/kg-day	Musculoskeletal	30	PPRTV	9/2020
Benzene	71-43-2	Subchronic	1.0E-02	mg/kg-day	(4)	1.0E-02	mg/kg-day	Immune, Blood	100	PPRTV	9/2020
Chloroform	67-66-3	Subchronic	1.0E-01	mg/kg-day	(4)	1.0E-01	mg/kg-day	Liver	100	ATSDR	8/2020
cis-1,2-Dichloroethene	156-59-2	Subchronic	2.0E-02	mg/kg-day	(4)	2.0E-02	mg/kg-day	Kidney	300	PPRTV	9/2020
Ethylbenzene	100-41-4	Subchronic	5.0E-02	mg/kg-day	(4)	5.0E-02	mg/kg-day	Liver	1,000	PPRTV	9/2020
n-Heptane	142-82-5	Subchronic	3.0E-03	mg/kg-day	(4)	3.0E-03	mg/kg-day	Gastrointestinal	1,000	PPRTV Appendix	9/2020
Tetrachloroethene	127-18-4	Subchronic	8.0E-03	mg/kg-day	(4)	8.0E-03	mg/kg-day	Nervous	300	ATSDR	8/2020
Total Xylenes	Tot-Xylenes	Subchronic	4.0E-01	mg/kg-day	(4)	4.0E-01	mg/kg-day	Decreased body weight	1,000	PPRTV	9/2020
Trichloroethylene	79-01-6	Subchronic	5.0E-04	mg/kg-day	(4)	5.0E-04	mg/kg-day	Developmental, Immune	10, 100, 1000	ATSDR	8/2020
Vinyl Chloride	75-01-4	(a)	3.0E-03	mg/kg-day	(4)	3.0E-03	mg/kg-day	Liver	30	IRIS	9/2020

Notes:

ATSDR = Agency for Toxic Substances and Disease Registry
CAS = Chemical Abstracts Service.
HEAST = Health Effects Assessment Summary Tables.
IRIS = Integrated Risk Information System.
mg/kg-day = Milligrams per kilogram per day.
N/A = Not Applicable/Not Available.
PCBs = Polychlorinated biphenyls.
PPRTV = Provisional Peer Reviewed Toxicity Values.
RfD = Reference Dose.
RSL = Regional Screening Level.
SVOCs = Semi-volatile organic compounds.
USEPA = United States Environmental Protection Agency.
VOCs = Volatile organic compounds.

TABLE 3-5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern (1)	CAS Number	Chronic/ Subchronic (2)	Oral RfD		Oral Absorption Efficiency for Dermal (3)	Absorbed RfD for Dermal (5)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
			Value	Units		Value	Units			Source(s)	Date(s) (6) (MM/YYYY)

(1) The following surrogates were used for chemicals without toxicity values or multiple forms:

RfD for cadmium in water used for evaluation of cadmium in groundwater; RfD for cadmium in food/diet used for evaluation of cadmium in soil.

RfD for chromium III, insoluble salts used.

RfD for manganese, non-diet used.

When assessing exposure to manganese in soil or drinking water, IRIS recommends applying a modifying factor of 3 to the oral RfD of 0.14 mg/kg-day. The USEPA Regional Screening Level (RSL) User's Guide (2020) also indicates that the average dietary manganese content (in the United States) of the diet (5 mg/day) be subtracted from the critical dose of 10 mg/day when assessing exposure to non-dietary manganese. Therefore, the RfD is (10 mg/day - 5 mg/day)/ Modifying Factor (3) = 1.67 mg/day / 70 kg = 0.024 mg/kg-day.

RfD for thallium is based on thallium soluble salts. No PPRTVs were developed for thallium in the PPRTV document (USEPA, 2012) due to database deficiencies.

Appendix A of the PPRTV document indicates that it is inappropriate to derive provisional chronic or subchronic RfDs for thallium, but that information is available which, although insufficient to support derivation of a provisional toxicity value, under current guidelines, may be of limited use to risk assessors as a screening value. The use of this screening provisional value is highly uncertain but is the value used in the USEPA RSL Tables (USEPA, 2020).

RfD for vanadium is derived from the IRIS oral RfD for Vanadium Pentoxide by factoring out the molecular weight (MW) of the oxide ion. Vanadium Pentoxide (V205) has a molecular weight of 181.88. The two atoms of Vanadium contribute 56% of the MW. Vanadium Pentoxide's oral RfD of 9E-03 mg/kg-day multiplied by 56% gives a Vanadium oral RfD of 5.04E-03 mg/kg-day.

RfD for Aroclor 1254 used for Total PCB Aroclors.

(2) Published value where available. Where not available, when the chronic RfD is based on a subchronic study, a subchronic RfD has been developed by the elimination of the uncertainty factor for subchronic to chronic adjustment. If no subchronic data are available, the chronic RfD has been adopted as the subchronic RfD.

(a) Subchronic data not available. Chronic RfD has therefore been adopted as the subchronic value.

(3) Oral Absorption Efficiencies from Exhibit 4-1 (USEPA, 2004. Risk Assessment Guidance for Superfund, Part E).

(4) Oral absorption efficiency exceeds 50%. Therefore, no adjustment of the oral reference dose is necessary (USEPA, 2001).

(5) Calculated as: (oral RfD) x (oral to dermal adjustment factor).

(6) Reflects the date associated with the source of the toxicity information. For online databases, including IRIS and PPRTV, the date reflects the date on which the information was obtained from the online source.

TABLE 3-5.2
NON-CANCER TOXICITY DATA -- INHALATION
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern	CAS Number	Chronic/ Subchronic (1)	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
			Value	Units			Source(s)	Date(s) (2) (MM/YYYY)
CHRONIC TOXICITY VALUES								
Inorganics								
Aluminum	7429-90-5	Chronic	5.0E+00	ug/m^3	Nervous	300	PPRTV	9/2020
Antimony	7440-36-0	Chronic	3.0E-01	ug/m^3	Respiratory	30	ATSDR	8/2020
Arsenic	7440-38-2	Chronic	1.5E-02	ug/m^3	Developmental, Cardiovascular, Nervous, Respiratory, Skin	30	CalEPA	9/2020
Barium	7440-39-3	Chronic	5.0E-01	ug/m^3	Developmental	1,000	HEAST	7/1997
Cadmium	7440-43-9	Chronic	1.0E-02	ug/m^3	Kidney	9	ATSDR	8/2020
Chromium	7440-47-3	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
Cobalt	7440-48-4	Chronic	6.0E-03	ug/m^3	Respiratory	300	PPRTV	9/2020
Copper	7440-50-8	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
Iron	7439-89-6	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
Lead	7439-92-1	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
Manganese	7439-96-5	Chronic	5.0E-02	ug/m^3	Nervous	1,000	IRIS	9/2020
Thallium	7440-28-0	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
Vanadium	7440-62-2	Chronic	1.0E-01	ug/m^3	Respiratory	30	ATSDR	8/2020
PCBs								
Total PCB Aroclors	Tot-PCB-ARO	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
SVOCs								
1-Methylnaphthalene	90-12-0	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
2-Methylnaphthalene	91-57-6	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)anthracene	56-55-3	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)Pyrene	50-32-8	Chronic	2.0E-03	ug/m^3	Developmental	3,000	IRIS	9/2020
Benzo(b)fluoranthene	205-99-2	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	53-70-3	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
Indeno(1,2,3-CD)Pyrene	193-39-5	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
Naphthalene	91-20-3	Chronic	3.0E+00	ug/m^3	Nervous, Respiratory	3,000	IRIS	9/2020
VOCs								
1,1,2,2-Tetrachloroethane	79-34-5	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
1,1,2-Trichloroethane	79-00-5	Chronic	2.0E-01	ug/m^3	Respiratory	3,000	PPRTV Appendix	9/2020
1,1-Dichloroethane	75-34-3	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
1,2,3-Trichlorobenzene	87-61-6	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
1,2,4-Trimethylbenzene	95-63-6	Chronic	6.0E+01	ug/m^3	Nervous	300	IRIS	9/2020
1,2-Dichloropropane	78-87-5	Chronic	4.0E+00	ug/m^3	Respiratory	300	IRIS	9/2020
Benzene	71-43-2	Chronic	3.0E+01	ug/m^3	Immune	300	IRIS	9/2020

TABLE 3-5.2
NON-CANCER TOXICITY DATA -- INHALATION
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern	CAS Number	Chronic/ Subchronic (1)	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
			Value	Units			Source(s)	Date(s) (2) (MM/YYYY)
Chloroform	67-66-3	Chronic	9.8E+01	ug/m^3	Liver	100	ATSDR (3)	8/2020
cis-1,2-Dichloroethene	156-59-2	Chronic	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	100-41-4	Chronic	1.0E+03	ug/m^3	Developmental	300	IRIS	9/2020
n-Heptane	142-82-5	Chronic	4.0E+02	ug/m^3	Ear	3,000	PPRTV	9/2020
Tetrachloroethene	127-18-4	Chronic	4.0E+01	ug/m^3	Nervous, Eye	1,000	IRIS	9/2020
Total Xylenes	Tot-Xylenes	Chronic	1.0E+02	ug/m^3	Nervous	300	IRIS	9/2020
Trichloroethylene	79-01-6	Chronic	2.0E+00	ug/m^3	Developmental, Immune	10, 100	IRIS	9/2020
Vinyl Chloride	75-01-4	Chronic	1.0E+02	ug/m^3	Liver	30	IRIS	09/01/20
SUBCHRONIC TOXICITY VALUES								
Inorganics								
Aluminum	7429-90-5	(a)	5.0E+00	ug/m^3	Nervous	300	PPRTV	9/2020
Antimony	7440-36-0	Subchronic	1.0E+00	ug/m^3	Respiratory	30	ATSDR	8/2020
Arsenic	7440-38-2	(a)	1.5E-02	ug/m^3	Developmental, Cardiovascular, Nervous, Respiratory, Skin	30	CalEPA	9/2020
Barium	7440-39-3	Subchronic	5.0E+00	ug/m^3	Developmental	100	HEAST	7/1997
Cadmium	7440-43-9	(a)	1.0E-02	ug/m^3	Kidney	9	ATSDR	8/2020
Chromium	7440-47-3	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
Cobalt	7440-48-4	Subchronic	2.0E-02	ug/m^3	Respiratory	100	PPRTV	9/2020
Copper	7440-50-8	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
Iron	7439-89-6	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
Lead	7439-92-1	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
Manganese	7439-96-5	Subchronic	3.0E-01	ug/m^3	Nervous	100	ATSDR	8/2020
Thallium	7440-28-0	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
Vanadium	7440-62-2	(a)	1.0E-01	ug/m^3	Respiratory	30	ATSDR	8/2020
PCBs								
Total PCB Aroclors	Tot-PCB-ARO	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
SVOCs								
1-Methylnaphthalene	90-12-0	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
2-Methylnaphthalene	91-57-6	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)anthracene	56-55-3	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)Pyrene	50-32-8	(a)	2.0E-03	ug/m3	Developmental	3,000	IRIS	9/2020
Benzo(b)fluoranthene	205-99-2	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 3-5.2
NON-CANCER TOXICITY DATA -- INHALATION
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern	CAS Number	Chronic/ Subchronic (1)	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
			Value	Units			Source(s)	Date(s) (2) (MM/YYYY)
Dibenzo(a,h)Anthracene	53-70-3	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
Indeno(1,2,3-CD)Pyrene	193-39-5	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
Naphthalene	91-20-3	(a)	3.0E+00	ug/m^3	Nervous, Respiratory	3,000	IRIS	9/2020
VOCs								
1,1,2,2-Tetrachloroethane	79-34-5	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
1,1,2-Trichloroethane	79-00-5	Subchronic	2.0E+00	ug/m^3	Respiratory	300	PPRTV Appendix	9/2020
1,1-Dichloroethane	75-34-3	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
1,2,3-Trichlorobenzene	87-61-6	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
1,2,4-Trimethylbenzene	95-63-6	Subchronic	2.0E+02	ug/m^3	Nervous	100	IRIS	9/2020
1,2-Dichloropropane	78-87-5	Subchronic	4.00E+00	ug/m^3	Respiratory	30	PPRTV	9/2020
Benzene	71-43-2	Subchronic	8.00E+01	ug/m^3	Immune, Blood	100	PPRTV	9/2020
Chloroform	67-66-3	Subchronic	2.4E+02	ug/m^3	Liver	300	ATSDR (3)	8/2020
cis-1,2-Dichloroethene	156-59-2	Subchronic	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	100-41-4	Subchronic	9.0E+03	ug/m^3	Ear	100	PPRTV	9/2020
n-Heptane	142-82-5	Subchronic	4.0E+03	ug/m^3	Ear	300	PPRTV	9/2020
Tetrachloroethene	127-18-4	Subchronic	4.1E+01	ug/m^3	Nervous	300	ATSDR (3)	8/2020
Total Xylenes	Tot-Xylenes	Subchronic	4.0E+02	ug/m^3	Nervous	100	PPRTV	9/2020
Trichloroethylene	79-01-6	Subchronic	2.2E+00	ug/m^3	Developmental, Immune	10, 100	ATSDR (3)	8/2020
Vinyl Chloride	75-01-4	Subchronic	7.7E+01	ug/m^3	Liver	30	ATSDR (3)	08/01/20

TABLE 3-5.2
NON-CANCER TOXICITY DATA -- INHALATION
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern	CAS Number	Chronic/ Subchronic (1)	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
			Value	Units			Source(s)	Date(s) (2) (MM/YYYY)

Notes:

ATSDR = Agency for Toxic Substances and Disease Registry.

CalEPA = California Environmental Protection Agency, Office of Environmental Health Hazard Assessment.

CAS = Chemical Abstracts Service.

HEAST = Health Effects Assessment Summary Tables.

IRIS = Integrated Risk Information System.

PCBs = Polychlorinated biphenyls.

PPRTV = Provisional Peer Reviewed Toxicity Value.

N/A = Not Applicable/Not Available.

RfC = Reference concentration.

RfD = Reference dose.

SVOCs = Semi-volatile organic compounds.

ug/m^3 = Micrograms per cubic meter.

VOCs = Volatile organic compounds.

(1) Published value where available. Where not available, when the chronic RfC is based on a subchronic study, a subchronic RfC has been developed by the elimination of the uncertainty factor for subchronic to chronic adjustment. If no subchronic data are available, the chronic RfC has been adopted as the subchronic RfC.

(a) Subchronic data not available. Chronic RfC has therefore been adopted as the subchronic value.

(2) Reflects the date associated with the source of the toxicity information. For online databases, including IRIS, CalEPA, and PPRTV, the date reflects the date on which the information was obtained from the online source.

(3) Intermediate Minimal Risk Level (MRL), presented in units of parts per million (ppm), converted to RfC.

TABLE 3-6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern (1)	CAS Number	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (2)	Absorbed Cancer Slope Factor for Dermal (4)		Weight of Evidence/ Cancer Guideline Description	Oral CSF		Mutagen?
		Value	Units		Value	Units		Source(s)	Date(s) (5) (MM/YYYY)	
Inorganics										
Aluminum	7429-90-5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No
Antimony	7440-36-0	N/A	N/A	0.15	N/A	N/A	N/A	N/A	N/A	No
Arsenic	7440-38-2	1.5E+00	$(mg/kg\text{-}day)^{-1}$	(3)	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	9/2020	No
Barium	7440-39-3	N/A	N/A	0.07	N/A	N/A	D	IRIS	9/2020	No
Cadmium	7440-43-9	N/A	N/A	0.05 / 0.025	N/A	N/A	B1	IRIS	9/2020	No
Chromium	7440-47-3	N/A	N/A	0.013	N/A	N/A	N/A	N/A	N/A	No
Cobalt	7440-48-4	N/A	N/A	N/A	N/A	N/A	N/A	PPRTV	9/2020	No
Copper	7440-50-8	N/A	N/A	N/A	N/A	N/A	D	IRIS	9/2020	No
Iron	7439-89-6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No
Lead	7439-92-1	N/A	N/A	N/A	N/A	N/A	B2	IRIS	9/2020	No
Manganese	7439-96-5	N/A	N/A	0.04	N/A	N/A	D	IRIS	9/2020	No
Thallium	7440-28-0	N/A	N/A	N/A	N/A	N/A	Inadequate	IRIS	9/2020	No
Vanadium	7440-62-2	N/A	N/A	0.026	N/A	N/A	N/A	N/A	N/A	No
PCBs										
Total PCB Aroclors	Tot-PCB-ARO	2.0E+00	$(mg/kg\text{-}day)^{-1}$	(3)	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	9/2020	No
SVOCs										
1-Methylnaphthalene	90-12-0	2.9E-02	$(mg/kg\text{-}day)^{-1}$	(3)	2.9E-02	$(mg/kg\text{-}day)^{-1}$	N/A	PPRTV	9/2020	No
2-Methylnaphthalene	91-57-6	N/A	N/A	N/A	N/A	N/A	Inadequate	IRIS	9/2020	No
Benzo(a)anthracene	56-55-3	1.0E-01	$(mg/kg\text{-}day)^{-1}$	(3)	1.0E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	9/2020	Yes
Benzo(a)Pyrene	50-32-8	1.0E+00	$(mg/kg\text{-}day)^{-1}$	(3)	1.0E+00	$(mg/kg\text{-}day)^{-1}$	Carcinogenic to humans	IRIS	9/2020	Yes
Benzo(b)fluoranthene	205-99-2	1.0E-01	$(mg/kg\text{-}day)^{-1}$	(3)	1.0E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	9/2020	Yes
Dibenzo(a,h)Anthracene	53-70-3	1.0E+00	$(mg/kg\text{-}day)^{-1}$	(3)	1.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	9/2020	Yes
Indeno(1,2,3-CD)Pyrene	193-39-5	1.0E-01	$(mg/kg\text{-}day)^{-1}$	(3)	1.0E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	9/2020	Yes
Naphthalene	91-20-3	1.2E-01	$(mg/kg\text{-}day)^{-1}$	(3)	1.2E-01	$(mg/kg\text{-}day)^{-1}$	C	CalEPA	9/2020	No
VOCs										
1,1,2,2-Tetrachloroethane	79-34-5	2.0E-01	$(mg/kg\text{-}day)^{-1}$	(3)	2.0E-01	$(mg/kg\text{-}day)^{-1}$	Likely carcinogenic to humans	IRIS	9/2020	No
1,1,2-Trichloroethane	79-00-5	5.7E-02	$(mg/kg\text{-}day)^{-1}$	(3)	5.7E-02	$(mg/kg\text{-}day)^{-1}$	C	IRIS	9/2020	No
1,1-Dichloroethane	75-34-3	5.7E-03	$(mg/kg\text{-}day)^{-1}$	(3)	5.7E-03	$(mg/kg\text{-}day)^{-1}$	C	CalEPA	9/2020	No
1,2,3-Trichlorobenzene	87-61-6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No
1,2,4-Trimethylbenzene	95-63-6	N/A	N/A	N/A	N/A	N/A	Inadequate	IRIS	9/2020	No
1,2-Dichloropropane	78-87-5	3.7E-02	$(mg/kg\text{-}day)^{-1}$	(3)	3.7E-02	$(mg/kg\text{-}day)^{-1}$	Likely carcinogenic to humans	PPRTV	9/2020	No
Benzene	71-43-2	5.5E-02	$(mg/kg\text{-}day)^{-1}$	(3)	5.5E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	9/2020	No

TABLE 3-6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern (1)	CAS Number	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (2)	Absorbed Cancer Slope Factor for Dermal (4)		Weight of Evidence/ Cancer Guideline Description	Oral CSF		Mutagen?
		Value	Units		Value	Units		Source(s)	Date(s) (5) (MM/YYYY)	
Chloroform	67-66-3	3.1E-02	$(mg/kg-day)^{-1}$	(3)	3.1E-02	$(mg/kg-day)^{-1}$	B2	CalEPA	9/2020	No
cis-1,2-Dichloroethene	156-59-2	N/A	N/A	N/A	N/A	N/A	Inadequate	IRIS	9/2020	No
Ethylbenzene	100-41-4	1.1E-02	$(mg/kg-day)^{-1}$	(3)	1.1E-02	$(mg/kg-day)^{-1}$	D	CalEPA	9/2020	No
n-Heptane	142-82-5	N/A	N/A	N/A	N/A	N/A	D	IRIS	9/2020	No
Tetrachloroethene	127-18-4	2.1E-03	$(mg/kg-day)^{-1}$	(3)	2.1E-03	$(mg/kg-day)^{-1}$	Likely carcinogenic to humans	IRIS	9/2020	No
Total Xylenes	Tot-Xylenes	N/A	N/A	N/A	N/A	N/A	Inadequate	IRIS	9/2020	No
Trichloroethylene (kidney effects) (6)	79-01-6	9.3E-03	$(mg/kg-day)^{-1}$	(3)	9.3E-03	$(mg/kg-day)^{-1}$	Carcinogenic to humans	IRIS	9/2020	Yes
Trichloroethylene (NHL+liver effects) (6)	79-01-6	3.7E-02	$(mg/kg-day)^{-1}$	(3)	3.7E-02	$(mg/kg-day)^{-1}$	Carcinogenic to humans	IRIS	9/2020	No
Vinyl Chloride (from birth) (7)	75-01-4	1.4E+00	$(mg/kg-day)^{-1}$	(3)	1.4E+00	$(mg/kg-day)^{-1}$	A, Known/likely human carcinogen	IRIS	9/2020	Yes (9)
Vinyl Chloride (adult only) (8)	75-01-4	7.2E-01	$(mg/kg-day)^{-1}$	(3)	7.2E-01	$(mg/kg-day)^{-1}$	A, Known/likely human carcinogen	IRIS	9/2020	Yes (9)

Notes:

CAS = Chemical Abstracts Service.

CSF = Cancer slope factor.

IRIS = Integrated Risk Information System.

mg/kg-day = Milligrams per kilogram per day.

N/A = Not Applicable/Not Available.

NHL = Non-Hodgkin's lymphoma.

PCBs = Polychlorinated biphenyls.

SVOCs = Semi-volatile organic compounds.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

USEPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen (by the oral route)

(1) The following surrogates were used for chemicals without toxicity values or multiple forms:

CSF for PCBs used for Aroclor-1254. The Reasonable Maximum Exposure (RME) slope factor presented represents the upper-bound slope factor for high risk and persistence situations.

CSF for benzo(a)pyrene, along with the appropriate relative potency factor (USEPA, 1993), used for the other carcinogenic polycyclic aromatic hydrocarbons (PAHs).

IRIS provides a range of CSF for benzene of 1.5E-02 to 5.5E-02 $(mg/kg-day)^{-1}$. IRIS states that each value within this range has equal scientific plausibility. The high end of the range is used to be conservative.

(2) Oral Absorption Efficiencies from Exhibit 4-1 (USEPA, 2004. Risk Assessment Guidance for Superfund, Part E).

(3) Oral absorption efficiency exceeds 50%. Therefore, no adjustment of the oral slope factor is necessary (USEPA, 2004. Risk Assessment Guidance for Superfund, Part E. Final. Exhibit 4-1).

(4) Calculated as: (oral slope factor) / (oral to dermal adjustment factor)

(5) Reflects the date associated with the source of the toxicity information. For online databases, including IRIS, the date reflects the date on which the information was obtained from the online source.

(6) CSF of 4.6E-02 per mg/kg-day was evaluated separately based on the CSF specific to kidney effects, evaluated for mutagenic mode of action, and non-Hodgkin's lymphoma (NHL) and liver, evaluated for non-mutagenic carcinogenic effects.

(7) Value for continuous lifetime exposure from birth used for evaluation of the residential exposure scenarios.

(8) Value for continuous lifetime exposure during adulthood used for evaluation of the worker exposure scenarios.

(9) The CSFs for vinyl chloride account for mutagenic effects, therefore, application of the age-dependent adjustment factors (ADAFs) is not necessary for evaluation of mutagenic mode of action.

TABLE 3-6.2
CANCER TOXICITY DATA -- INHALATION
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern (1)	CAS Number	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
		Value	Units		Source(s)	Date(s) (2) (MM/YYYY)
Inorganics						
Aluminum	7429-90-5	N/A	N/A	N/A	N/A	N/A
Antimony	7440-36-0	N/A	N/A	N/A	N/A	N/A
Arsenic	7440-38-2	4.3E-03	$(ug/m^3)^{-1}$	A	IRIS	9/2020
Barium	7440-39-3	N/A	N/A	D	IRIS	9/2020
Cadmium	7440-43-9	1.8E-03	$(ug/m^3)^{-1}$	B1	IRIS	9/2020
Chromium	7440-47-3	N/A	N/A	D	IRIS	9/2020
Cobalt	7440-48-4	9.0E-03	$(ug/m^3)^{-1}$	B2	PPRTV	9/2020
Copper	7440-50-8	N/A	N/A	D	IRIS	9/2020
Iron	7439-89-6	N/A	N/A	N/A	N/A	N/A
Lead	7439-92-1	N/A	N/A	B2	IRIS	9/2020
Manganese	7439-96-5	N/A	N/A	D	IRIS	9/2020
Thallium	7440-28-0	N/A	N/A	Inadequate	IRIS	9/2020
Vanadium	7440-62-2	N/A	N/A	N/A	N/A	N/A
PCBs						
Total PCB Aroclors	Tot-PCB-ARO	5.7E-04	$(ug/m^3)^{-1}$	B2	IRIS (3)	9/2020
SVOCs						
1-Methylnaphthalene	90-12-0	N/A	N/A	N/A	N/A	N/A
2-Methylnaphthalene	91-57-6	N/A	N/A	Inadequate	IRIS	9/2020
Benzo(a)anthracene	56-55-3	6.0E-05	$(ug/m^3)^{-1}$	B2	IRIS	9/2020
Benzo(a)Pyrene	50-32-8	6.0E-04	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	9/2020
Benzo(b)fluoranthene	205-99-2	6.0E-05	$(ug/m^3)^{-1}$	B2	IRIS	9/2020
Dibenzo(a,h)Anthracene	53-70-3	6.0E-04	$(ug/m^3)^{-1}$	B2	IRIS	9/2020
Indeno(1,2,3-CD)Pyrene	193-39-5	6.0E-05	$(ug/m^3)^{-1}$	B2	IRIS	9/2020
Naphthalene	91-20-3	3.4E-05	$(ug/m^3)^{-1}$	C	CalEPA	9/2020

TABLE 3-6.2
CANCER TOXICITY DATA -- INHALATION
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern (1)	CAS Number	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
		Value	Units		Source(s)	Date(s) (2) (MM/YYYY)
VOCs						
1,1,2,2-Tetrachloroethane	79-34-5	5.8E-05	$(ug/m^3)^{-1}$	Likely carcinogenic to humans	CalEPA	9/2020
1,1,2-Trichloroethane	79-00-5	1.6E-05	$(ug/m^3)^{-1}$	C	IRIS	9/2020
1,1-Dichloroethane	75-34-3	1.6E-06	$(ug/m^3)^{-1}$	C	CalEPA	9/2020
1,2,3-Trichlorobenzene	87-61-6	N/A	N/A	N/A	N/A	N/A
1,2,4-Trimethylbenzene	95-63-6	N/A	N/A	Inadequate	IRIS	9/2020
1,2-Dichloropropane	78-87-5	3.7E-06	$(ug/m^3)^{-1}$	Likely carcinogenic to humans	PPRTV	9/2020
Benzene	71-43-2	7.8E-06	$(ug/m^3)^{-1}$	A	IRIS	9/2020
Chloroform	67-66-3	2.3E-05	$(ug/m^3)^{-1}$	B2	IRIS	9/2020
cis-1,2-Dichloroethene	156-59-2	N/A	N/A	Inadequate	IRIS	9/2020
Ethylbenzene	100-41-4	2.5E-06	$(ug/m^3)^{-1}$	D	CalEPA	9/2020
n-Heptane	142-82-5	N/A	N/A	D	IRIS	9/2020
Tetrachloroethene	127-18-4	2.6E-07	$(ug/m^3)^{-1}$	Likely carcinogenic to humans	IRIS	9/2020
Total Xylenes	Tot-Xylenes	N/A	N/A	Inadequate	IRIS	9/2020
Trichloroethylene (kidney effects) (4)	79-01-6	1.0E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	9/2020
Trichloroethylene (NHL+liver effects) (4)	79-01-6	3.1E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	9/2020
Vinyl Chloride (from birth) (5)	75-01-4	8.8E-06	$(ug/m^3)^{-1}$	A, Known/likely human carcinogen	IRIS	9/2020
Vinyl Chloride (adult only) (6)	75-01-4	4.4E-06	$(ug/m^3)^{-1}$	A, Known/likely human carcinogen	IRIS	9/2020

TABLE 3-6.2
CANCER TOXICITY DATA -- INHALATION
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern (1)	CAS Number	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
		Value	Units		Source(s)	Date(s) (2) (MM/YYYY)

Notes:

CAS = Chemical Abstracts Service.

CalEPA = California Environmental Protection Agency. Office of Environmental Health Hazard Assessment (OEHHA).

CSF = Cancer slope factor.

IRIS = Integrated Risk Information System.

N/A = Not Applicable/Not Available.

NHL = Non-Hodgkin's lymphoma.

PCBs = Polychlorinated biphenyls.

PPRTV = Provisional Peer Reviewed Toxicity Values.

SVOCs = Semi-volatile organic compounds.

ug/m^3 = Micrograms per cubic meter.

URF = Unit risk factor.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

USEPA Group:

A - Human carcinogen

B1 - Probable human carcinogen = indicates that limited human data are available

B2 - Probable human carcinogen = indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

(1) The following surrogates were used for chemicals without toxicity values or multiple forms:
URF for benzo(a)pyrene, along with the appropriate relative potency factor (USEPA, 1993), used for the other carcinogenic polycyclic aromatic hydrocarbons (PAHs).
IRIS provides a range of URF for benzene of 2.2E-6 (ug/m3)-1 to 7.8E-6 (ug/m3)-1. IRIS states that each value within this range has equal scientific plausibility. The high end of the range is used to be conservative.

(2) Reflects the date associated with the source of the toxicity information. For online databases, including IRIS, CalEPA, and PPRTV, the date reflects the date on which obtained from the online source.

(3) Consistent with the IRIS file for PCBs, for inhalation of dust containing PCBs, the high risk and persistence slope factors are used. The Reasonable Maximum Exposure (RME) URF presented represents the upper-bound slope factor.
The URF was converted from the slope factors as follows: Upper-bound URF: [2 (milligram per kilogram [mg/kg]-day) $^{-1}$ x (20 cubic meter [m^3]/day / 70 kilogram) x 1 milligram / 1000 microgram] =0.00057 (ug/m^3)$^{-1}$

(4) URF of 4.1E-06 (ug/m^3)$^{-1}$ was evaluated separately based on the URF specific to kidney effects, evaluated for mutagenic mode of action, and non-Hodgkin's lymphoma (NHL) and liver, evaluated for non-mutagenic carcinogenic effects.

(5) Value for continuous lifetime exposure from birth used for evaluation of the residential/recreational exposure scenarios.

(6) Value for continuous lifetime exposure during adulthood used for evaluation of the worker exposure scenarios.

TABLE 3-7.1
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CONSTRUCTION/UTILITY WORKER
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR			Cancer	Intake/Exposure Concentration		RfD or RfC		Hazard
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Risk	Value	Units	Value	Units	Quotient
Soil	Surface Soil	On-Project Blue Beach Area	Incidental Ingestion	**Inorganics**													
				Antimony	3.80E-01	mg/kg	2.45E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.72E-07	mg/kg-day	4.00E-04	mg/kg-day	4.3E-04
				Cadmium	2.17E+00	mg/kg	1.40E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	9.82E-07	mg/kg-day	1.00E-03	mg/kg-day	9.8E-04
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	2.00E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	4.0E-09	1.40E-07	mg/kg-day	3.00E-05	mg/kg-day	4.7E-03
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	2.00E-10	mg/kg-day	1.00E+00	kg-day/mg	1	2.0E-10	1.40E-08	mg/kg-day	N/A	mg/kg-day	N/A
			Exp. Route Total									4E-09					6E-03
			Dermal														
				Inorganics													
				Antimony	3.80E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	6.00E-05	mg/kg-day	N/A
				Cadmium	2.17E+00	mg/kg	4.50E-11	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.15E-09	mg/kg-day	2.50E-05	mg/kg-day	1.3E-04
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	8.99E-10	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.8E-09	6.29E-08	mg/kg-day	3.00E-05	mg/kg-day	2.1E-03
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	8.32E-11	mg/kg-day	1.00E+00	kg-day/mg	1	8.3E-11	5.82E-09	mg/kg-day	N/A	mg/kg-day	N/A
			Exp. Route Total									2E-09					2E-03
	Fugitive Dust/ Particulates and Volatiles from Surface Soil	On-Project Blue Beach Area	Inhalation	**Inorganics**													
				Antimony	3.80E-01	mg/kg	3.20E-07	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	2.24E-05	ug/m^3	1.00E+00	ug/m^3	2.2E-05
				Cadmium	2.17E+00	mg/kg	1.83E-06	ug/m^3	1.80E-03	$(ug/m^3)^{-1}$	N/A	3.3E-09	1.28E-04	ug/m^3	1.00E-02	ug/m^3	1.3E-02
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	3.23E-06	ug/m^3	5.70E-04	$(ug/m^3)^{-1}$	N/A	1.8E-09	2.26E-04	ug/m^3	N/A	ug/m^3	N/A
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	2.60E-08	ug/m^3	6.00E-04	$(ug/m^3)^{-1}$	1	1.6E-11	1.82E-06	ug/m^3	N/A	ug/m^3	N/A
			Exp. Route Total									5E-09					1E-02
Surface Soil Total												**1E-08**					**2E-02**

TABLE 3-7.1
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CONSTRUCTION/UTILITY WORKER
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR			Cancer	Intake/Exposure Concentration		RfD or RfC		Hazard
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Risk	Value	Units	Value	Units	Quotient
Soil	Subsurface Soil	On-Project Blue Beach Area	Incidental Ingestion	**Inorganics**													
				Antimony	3.51E-01	mg/kg	2.27E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.59E-07	mg/kg-day	4.00E-04	mg/kg-day	4.0E-04
				Cadmium	2.12E+00	mg/kg	1.37E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	9.57E-07	mg/kg-day	1.00E-03	mg/kg-day	9.6E-04
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	8.40E-10	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.7E-09	5.88E-08	mg/kg-day	3.00E-05	mg/kg-day	2.0E-03
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	7.42E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	5.19E-06	mg/kg-day	4.00E-02	mg/kg-day	1.3E-04
				Ethylbenzene	1.60E+01	mg/kg	1.03E-07	mg/kg-day	1.10E-02	kg-day/mg	N/A	1.1E-09	7.23E-06	mg/kg-day	5.00E-02	mg/kg-day	1.4E-04
				Total Xylenes	1.01E+02	mg/kg	6.52E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	4.57E-05	mg/kg-day	4.00E-01	mg/kg-day	1.1E-04
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	4.79E-09	mg/kg-day	9.30E-03	kg-day/mg	1	4.5E-11	3.35E-07	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	4.79E-09	mg/kg-day	3.70E-02	kg-day/mg	N/A	1.8E-10	3.35E-07	mg/kg-day	5.00E-04	mg/kg-day	6.7E-04
			Exp. Route Total									3E-09					4E-03
			Dermal														
				Inorganics													
				Antimony	3.51E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	6.00E-05	mg/kg-day	N/A
				Cadmium	2.12E+00	mg/kg	4.39E-11	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.07E-09	mg/kg-day	2.50E-05	mg/kg-day	1.2E-04
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	3.77E-10	mg/kg-day	2.00E+00	kg-day/mg	N/A	7.5E-10	2.64E-08	mg/kg-day	3.00E-05	mg/kg-day	8.8E-04
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	4.00E-02	mg/kg-day	N/A
				Ethylbenzene	1.60E+01	mg/kg	N/A	mg/kg-day	1.10E-02	kg-day/mg	N/A	N/A	N/A	mg/kg-day	5.00E-02	mg/kg-day	N/A
				Total Xylenes	1.01E+02	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	4.00E-01	mg/kg-day	N/A
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	N/A	mg/kg-day	9.30E-03	kg-day/mg	1	N/A	N/A	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	N/A	mg/kg-day	3.70E-02	kg-day/mg	N/A	N/A	N/A	mg/kg-day	5.00E-04	mg/kg-day	N/A
			Exp. Route Total									8E-10					1E-03
	Fugitive Dust/ Particulates and Volatiles from Subsurface Soil	On-Project Blue Beach Area	Inhalation	**Inorganics**													
				Antimony	3.51E-01	mg/kg	2.96E-07	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	2.07E-05	ug/m^3	1.00E+00	ug/m^3	2.1E-05
				Cadmium	2.12E+00	mg/kg	1.79E-06	ug/m^3	1.80E-03	$(ug/m^3)^{-1}$	N/A	3.2E-09	1.25E-04	ug/m^3	1.00E-02	ug/m^3	1.2E-02
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	1.35E-06	ug/m^3	5.70E-04	$(ug/m^3)^{-1}$	N/A	7.7E-10	9.48E-05	ug/m^3	N/A	ug/m^3	N/A
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	7.40E-03	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	5.18E-01	ug/m^3	2.00E+02	ug/m^3	2.6E-03
				Ethylbenzene	1.60E+01	mg/kg	1.44E-02	ug/m^3	2.50E-06	$(ug/m^3)^{-1}$	N/A	3.6E-08	1.01E+00	ug/m^3	9.00E+03	ug/m^3	1.1E-04
				Total Xylenes	1.01E+02	mg/kg	8.97E-02	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	6.28E+00	ug/m^3	4.00E+02	ug/m^3	1.6E-02
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	1.71E-03	ug/m^3	1.00E-06	$(ug/m^3)^{-1}$	1	1.7E-09	1.20E-01	ug/m^3	N/A	ug/m^3	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	1.71E-03	ug/m^3	3.10E-06	$(ug/m^3)^{-1}$	N/A	5.3E-09	1.20E-01	ug/m^3	2.20E+00	ug/m^3	5.4E-02
			Exp. Route Total									5E-08					9E-02
Subsurface Soil Total												**5E-08**					**9E-02**

TABLE 3-7.1
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CONSTRUCTION/UTILITY WORKER
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR			Cancer	Intake/Exposure Concentration		RfD or RfC		Hazard
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Risk	Value	Units	Value	Units	Quotient
Groundwater	Shallow Groundwater	On-Project Blue Beach Area	Incidental Ingestion	**Inorganics**													
				Antimony	2.22E+00	ug/L	2.17E-10	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.52E-08	mg/kg-day	4.00E-04	mg/kg-day	3.8E-05
				Arsenic	4.04E+00	ug/L	3.96E-10	mg/kg-day	1.50E+00	kg-day/mg	N/A	5.9E-10	2.77E-08	mg/kg-day	3.00E-04	mg/kg-day	9.2E-05
				Cadmium	2.06E+01	ug/L	2.01E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.41E-07	mg/kg-day	5.00E-04	mg/kg-day	2.8E-04
				Cobalt	4.29E+00	ug/L	4.19E-10	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.93E-08	mg/kg-day	3.00E-03	mg/kg-day	9.8E-06
				Iron	6.03E+04	ug/L	5.90E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	4.13E-04	mg/kg-day	7.00E-01	mg/kg-day	5.9E-04
				Manganese	3.18E+03	ug/L	3.11E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.18E-05	mg/kg-day	2.40E-02	mg/kg-day	9.1E-04
				SVOCs													
				1-Methylnaphthalene	9.00E+01	ug/L	8.81E-09	mg/kg-day	2.90E-02	kg-day/mg	N/A	2.6E-10	6.16E-07	mg/kg-day	7.00E-02	mg/kg-day	8.8E-06
				2-Methylnaphthalene	8.50E+01	ug/L	8.32E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	5.82E-07	mg/kg-day	4.00E-03	mg/kg-day	1.5E-04
				Benzo(a)anthracene	1.38E-01	ug/L	1.35E-11	mg/kg-day	1.00E-01	kg-day/mg	1	1.4E-12	9.45E-10	mg/kg-day	N/A	mg/kg-day	N/A
				Benzo(a)Pyrene	1.41E-01	ug/L	1.38E-11	mg/kg-day	1.00E+00	kg-day/mg	1	1.4E-11	9.66E-10	mg/kg-day	3.00E-04	mg/kg-day	3.2E-06
				Benzo(b)fluoranthene	2.05E-01	ug/L	2.01E-11	mg/kg-day	1.00E-01	kg-day/mg	1	2.0E-12	1.40E-09	mg/kg-day	N/A	mg/kg-day	N/A
				Naphthalene	2.50E+02	ug/L	2.45E-08	mg/kg-day	1.20E-01	kg-day/mg	N/A	2.9E-09	1.71E-06	mg/kg-day	6.00E-01	mg/kg-day	2.9E-06
				VOCs													
				1,2,4-Trimethylbenzene	3.20E+02	ug/L	3.13E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.19E-06	mg/kg-day	4.00E-02	mg/kg-day	5.5E-05
				1,2-Dichloropropane	9.40E-01	ug/L	9.20E-11	mg/kg-day	3.70E-02	kg-day/mg	N/A	3.4E-12	6.44E-09	mg/kg-day	4.00E-02	mg/kg-day	1.6E-07
				cis-1,2-Dichloroethene	2.28E+00	ug/L	2.23E-10	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.56E-08	mg/kg-day	2.00E-02	mg/kg-day	7.8E-07
				Ethylbenzene	4.80E+00	ug/L	4.70E-10	mg/kg-day	1.10E-02	kg-day/mg	N/A	5.2E-12	3.29E-08	mg/kg-day	5.00E-02	mg/kg-day	6.6E-07
				Total Xylenes	4.10E+01	ug/L	4.01E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.81E-07	mg/kg-day	4.00E-01	mg/kg-day	7.0E-07
				Trichloroethylene (kidney effects)	2.52E+01	ug/L	2.46E-09	mg/kg-day	9.30E-03	kg-day/mg	1	2.3E-11	1.72E-07	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	2.52E+01	ug/L	2.46E-09	mg/kg-day	3.70E-02	kg-day/mg	N/A	9.1E-11	1.72E-07	mg/kg-day	5.00E-04	mg/kg-day	3.4E-04
			Exp. Route Total									4E-09					2E-03

TABLE 3-7.1
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CONSTRUCTION/UTILITY WORKER
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR			Cancer	Intake/Exposure Concentration		RfD or RfC		Hazard
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Risk	Value	Units	Value	Units	Quotient
Groundwater	Shallow Groundwater	On-Project Blue Beach Area	Dermal	**Inorganics**													
				Antimony	2.22E+00	ug/L	1.53E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.07E-07	mg/kg-day	6.00E-05	mg/kg-day	1.8E-03
				Arsenic	4.04E+00	ug/L	2.79E-09	mg/kg-day	1.50E+00	kg-day/mg	N/A	4.2E-09	1.95E-07	mg/kg-day	3.00E-04	mg/kg-day	6.5E-04
				Cadmium	2.06E+01	ug/L	1.42E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	9.94E-07	mg/kg-day	2.50E-05	mg/kg-day	4.0E-02
				Cobalt	4.29E+00	ug/L	1.18E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	8.28E-08	mg/kg-day	3.00E-03	mg/kg-day	2.8E-05
				Iron	6.03E+04	ug/L	4.16E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.91E-03	mg/kg-day	7.00E-01	mg/kg-day	4.2E-03
				Manganese	3.18E+03	ug/L	2.19E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.54E-04	mg/kg-day	9.60E-04	mg/kg-day	1.6E-01
				SVOCs													
				1-Methylnaphthalene	9.00E+01	ug/L	5.13E-06	mg/kg-day	2.90E-02	kg-day/mg	N/A	1.5E-07	3.59E-04	mg/kg-day	7.00E-02	mg/kg-day	5.1E-03
				2-Methylnaphthalene	8.50E+01	ug/L	4.78E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.35E-04	mg/kg-day	4.00E-03	mg/kg-day	8.4E-02
				Benzo(a)anthracene	1.38E-01	ug/L	N/A	mg/kg-day	1.00E-01	kg-day/mg	1	N/A	N/A	mg/kg-day	N/A	mg/kg-day	N/A
				Benzo(a)Pyrene	1.41E-01	ug/L	N/A	mg/kg-day	1.00E+00	kg-day/mg	1	N/A	N/A	mg/kg-day	3.00E-04	mg/kg-day	N/A
				Benzo(b)fluoranthene	2.05E-01	ug/L	N/A	mg/kg-day	1.00E-01	kg-day/mg	1	N/A	N/A	mg/kg-day	N/A	mg/kg-day	N/A
				Naphthalene	2.50E+02	ug/L	7.76E-06	mg/kg-day	1.20E-01	kg-day/mg	N/A	9.3E-07	5.43E-04	mg/kg-day	6.00E-01	mg/kg-day	9.1E-04
				VOCs													
				1,2,4-Trimethylbenzene	3.20E+02	ug/L	1.64E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.15E-03	mg/kg-day	4.00E-02	mg/kg-day	2.9E-02
				1,2-Dichloropropane	9.40E-01	ug/L	5.36E-09	mg/kg-day	3.70E-02	kg-day/mg	N/A	2.0E-10	3.75E-07	mg/kg-day	4.00E-02	mg/kg-day	9.4E-06
				cis-1,2-Dichloroethene	2.28E+00	ug/L	1.80E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.26E-06	mg/kg-day	2.00E-02	mg/kg-day	6.3E-05
				Ethylbenzene	4.80E+00	ug/L	1.53E-07	mg/kg-day	1.10E-02	kg-day/mg	N/A	1.7E-09	1.07E-05	mg/kg-day	5.00E-02	mg/kg-day	2.1E-04
				Total Xylenes	4.10E+01	ug/L	1.32E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	9.26E-05	mg/kg-day	4.00E-01	mg/kg-day	2.3E-04
				Trichloroethylene (kidney effects)	2.52E+01	ug/L	2.17E-07	mg/kg-day	9.30E-03	kg-day/mg	1	2.0E-09	1.52E-05	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	2.52E+01	ug/L	2.17E-07	mg/kg-day	3.70E-02	kg-day/mg	N/A	8.0E-09	1.52E-05	mg/kg-day	5.00E-04	mg/kg-day	3.0E-02
			Exp. Route Total									1E-06					4E-01

TABLE 3-7.1
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - CONSTRUCTION/UTILITY WORKER
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF (1)	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Groundwater	Trench Air	On-Project	Inhalation														
		Blue Beach		**SVOCs**													
		Area		1-Methylnaphthalene	1.37E+00	ug/m^3	8.96E-04	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	6.27E-02	ug/m^3	N/A	ug/m^3	N/A
				2-Methylnaphthalene	1.29E+00	ug/m^3	8.40E-04	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	5.88E-02	ug/m^3	N/A	ug/m^3	N/A
				Benzo(a)anthracene	5.68E-04	ug/m^3	3.71E-07	ug/m^3	6.00E-05	(ug/m^3)$^{-1}$	1	2.2E-11	2.60E-05	ug/m^3	N/A	ug/m^3	N/A
				Naphthalene	4.05E+00	ug/m^3	2.64E-03	ug/m^3	3.40E-05	(ug/m^3)$^{-1}$	N/A	9.0E-08	1.85E-01	ug/m^3	3.00E+00	ug/m^3	6.2E-02
				VOCs													
				1,2,4-Trimethylbenzene	5.11E+00	ug/m^3	3.33E-03	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	2.33E-01	ug/m^3	2.00E+02	ug/m^3	1.2E-03
				1,2-Dichloropropane	1.83E-02	ug/m^3	1.20E-05	ug/m^3	3.70E-06	(ug/m^3)$^{-1}$	N/A	4.4E-11	8.38E-04	ug/m^3	4.00E+00	ug/m^3	2.1E-04
				cis-1,2-Dichloroethene	5.20E-02	ug/m^3	3.39E-05	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	2.37E-03	ug/m^3	N/A	ug/m^3	N/A
				Ethylbenzene	8.18E-02	ug/m^3	5.34E-05	ug/m^3	2.50E-06	(ug/m^3)$^{-1}$	N/A	1.3E-10	3.74E-03	ug/m^3	9.00E+03	ug/m^3	4.2E-07
				Total Xylenes	6.99E-01	ug/m^3	4.56E-04	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	3.19E-02	ug/m^3	4.00E+02	ug/m^3	8.0E-05
				Trichloroethylene (kidney effects)	5.19E-01	ug/m^3	3.38E-04	ug/m^3	1.00E-06	(ug/m^3)$^{-1}$	1	3.4E-10	2.37E-02	ug/m^3	N/A	ug/m^3	N/A
				Trichloroethylene (NHL+liver effects)	5.19E-01	ug/m^3	3.38E-04	ug/m^3	3.10E-06	(ug/m^3)$^{-1}$	N/A	1.0E-09	2.37E-02	ug/m^3	2.20E+00	ug/m^3	1.1E-02
			Exp. Route Total									9E-08					7E-02
Groundwater Total												**1E-06**					**4E-01**
Total Receptor Risk/Hazard												(2)					(2)

Notes:
ADAF = Age-dependent adjustment factor.
CSF = Cancer slope factor.
EPC = Exposure point concentration.
IUR = Inhalation unit risk factor.
N/A = Not applicable.
NHL = Non-Hodgkin's lymphoma.
PCBs = Polychlorinated biphenyls.
RfC = Inhalation reference concentration.
RfD = Oral reference dose.
RME = Reasonable Maximum Exposure.
SVOCs = Semivolatile organic compounds.
VOCs = Volatile organic compounds.
(1) ADAF is used for chemicals with a mutagenic mode of action for carcinogenesis. The cancer risk is adjusted by multiplying the calculated risk by the ADAF.
(2) Presented on corresponding summary of risk/hazard table.

TABLE 3-7.2
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - OUTDOOR WORKER
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Receptor Population: Outdoor Worker
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR			Cancer	Intake/Exposure Concentration		RfD or RfC		Hazard
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Risk	Value	Units	Value	Units	Quotient
Soil	Surface Soil	On-Project Blue Beach Area	Incidental Ingestion	**Inorganics**													
				Antimony	3.80E-01	mg/kg	1.16E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.25E-07	mg/kg-day	4.00E-04	mg/kg-day	8.1E-04
				Cadmium	2.17E+00	mg/kg	6.64E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.86E-06	mg/kg-day	1.00E-03	mg/kg-day	1.9E-03
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	9.48E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.9E-07	2.65E-07	mg/kg-day	2.00E-05	mg/kg-day	1.3E-02
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	9.45E-09	mg/kg-day	1.00E+00	kg-day/mg	1	9.4E-09	2.65E-08	mg/kg-day	N/A	mg/kg-day	N/A
			Exp. Route Total									2E-07					2E-02
			Dermal														
				Inorganics													
				Antimony	3.80E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	6.00E-05	mg/kg-day	N/A
				Cadmium	2.17E+00	mg/kg	2.81E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	7.87E-09	mg/kg-day	2.50E-05	mg/kg-day	3.1E-04
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	5.62E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.1E-07	1.57E-07	mg/kg-day	2.00E-05	mg/kg-day	7.9E-03
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	5.20E-09	mg/kg-day	1.00E+00	kg-day/mg	1	5.2E-09	1.46E-08	mg/kg-day	N/A	mg/kg-day	N/A
			Exp. Route Total									1E-07					8E-03
	Fugitive Dust/ Particulates and Volatiles from Surface Soil	On-Project Blue Beach Area	Inhalation	**Inorganics**													
				Antimony	3.80E-01	mg/kg	2.28E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	6.38E-08	ug/m^3	3.00E-01	ug/m^3	2.1E-07
				Cadmium	2.17E+00	mg/kg	1.30E-07	ug/m^3	1.80E-03	$(ug/m^3)^{-1}$	N/A	2.3E-10	3.65E-07	ug/m^3	1.00E-02	ug/m^3	3.6E-05
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	7.52E-05	ug/m^3	5.70E-04	$(ug/m^3)^{-1}$	N/A	4.3E-08	2.11E-04	ug/m^3	N/A	ug/m^3	N/A
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	1.85E-09	ug/m^3	6.00E-04	$(ug/m^3)^{-1}$	1	1.1E-12	5.19E-09	ug/m^3	N/A	ug/m^3	N/A
			Exp. Route Total									4E-08					4E-05
Surface Soil Total												**4E-07**					**2E-02**

TABLE 3-7.2
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - OUTDOOR WORKER
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Receptor Population: Outdoor Worker
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Soil	Subsurface Soil	On-Project Blue Beach Area	Incidental Ingestion	**Inorganics**													
				Antimony	3.51E-01	mg/kg	1.07E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.01E-07	mg/kg-day	4.00E-04	mg/kg-day	7.5E-04
				Cadmium	2.12E+00	mg/kg	6.48E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.81E-06	mg/kg-day	1.00E-03	mg/kg-day	1.8E-03
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	3.98E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	8.0E-08	1.11E-07	mg/kg-day	2.00E-05	mg/kg-day	5.6E-03
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	3.51E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	9.84E-06	mg/kg-day	1.00E-02	mg/kg-day	9.8E-04
				Ethylbenzene	1.60E+01	mg/kg	4.89E-06	mg/kg-day	1.10E-02	kg-day/mg	N/A	5.4E-08	1.37E-05	mg/kg-day	1.00E-01	mg/kg-day	1.4E-04
				Total Xylenes	1.01E+02	mg/kg	3.09E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	8.65E-05	mg/kg-day	2.00E-01	mg/kg-day	4.3E-04
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	2.27E-07	mg/kg-day	9.30E-03	kg-day/mg	1	2.1E-09	6.34E-07	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	2.27E-07	mg/kg-day	3.70E-02	kg-day/mg	N/A	8.4E-09	6.34E-07	mg/kg-day	5.00E-04	mg/kg-day	1.3E-03
			Exp. Route Total									1E-07					1E-02
			Dermal														
				Inorganics													
				Antimony	3.51E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	6.00E-05	mg/kg-day	N/A
				Cadmium	2.12E+00	mg/kg	2.74E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	7.67E-09	mg/kg-day	2.50E-05	mg/kg-day	3.1E-04
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	2.36E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	4.7E-08	6.60E-08	mg/kg-day	2.00E-05	mg/kg-day	3.3E-03
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-02	mg/kg-day	N/A
				Ethylbenzene	1.60E+01	mg/kg	N/A	mg/kg-day	1.10E-02	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-01	mg/kg-day	N/A
				Total Xylenes	1.01E+02	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	2.00E-01	mg/kg-day	N/A
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	N/A	mg/kg-day	9.30E-03	kg-day/mg	1	N/A	N/A	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	N/A	mg/kg-day	3.70E-02	kg-day/mg	N/A	N/A	N/A	mg/kg-day	5.00E-04	mg/kg-day	N/A
			Exp. Route Total									5E-08					4E-03
	Fugitive Dust/ Particulates and Volatiles from Subsurface Soil	On-Project Blue Beach Area	Inhalation	**Inorganics**													
				Antimony	3.51E-01	mg/kg	2.10E-08	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	5.89E-08	ug/m^3	3.00E-01	ug/m^3	2.0E-07
				Cadmium	2.12E+00	mg/kg	1.27E-07	ug/m^3	1.80E-03	(ug/m^3)$^{-1}$	N/A	2.3E-10	3.56E-07	ug/m^3	1.00E-02	ug/m^3	3.6E-05
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	3.15E-05	ug/m^3	5.70E-04	(ug/m^3)$^{-1}$	N/A	1.8E-08	8.83E-05	ug/m^3	N/A	ug/m^3	N/A
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	1.87E-01	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	5.25E-01	ug/m^3	6.00E+01	ug/m^3	8.7E-03
				Ethylbenzene	1.60E+01	mg/kg	3.64E-01	ug/m^3	2.50E-06	(ug/m^3)$^{-1}$	N/A	9.1E-07	1.02E+00	ug/m^3	1.00E+03	ug/m^3	1.0E-03
				Total Xylenes	1.01E+02	mg/kg	2.27E+00	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	6.36E+00	ug/m^3	1.00E+02	ug/m^3	6.4E-02
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	4.33E-02	ug/m^3	1.00E-06	(ug/m^3)$^{-1}$	1	4.3E-08	1.21E-01	ug/m^3	N/A	ug/m^3	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	4.33E-02	ug/m^3	3.10E-06	(ug/m^3)$^{-1}$	N/A	1.3E-07	1.21E-01	ug/m^3	2.00E+00	ug/m^3	6.1E-02
			Exp. Route Total									1E-06					1E-01
Subsurface Soil Total												**1E-06**					**1E-01**
Total Receptor Risk/Hazard												(2)					(2)

TABLE 3-7.2
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - OUTDOOR WORKER
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Receptor Population: Outdoor Worker
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF (1)	Cancer Risk	Value	Units	Value	Units	Hazard Quotient

Notes:
ADAF = Age-dependent adjustment factor.
CSF = Cancer slope factor.
EPC = Exposure point concentration.
IUR = Inhalation unit risk factor.
N/A = Not applicable.
NHL = Non-Hodgkin's lymphoma.
PCBs = Polychlorinated biphenyls.
RfC = Inhalation reference concentration.
RfD = Oral reference dose.
RME = Reasonable Maximum Exposure.
SVOCs = Semivolatile organic compounds.
VOCs = Volatile organic compounds.
(1) ADAF is used for chemicals with a mutagenic mode of action for carcinogenesis. The cancer risk is adjusted by multiplying the calculated risk by the ADAF.
(2) Presented on corresponding summary of risk/hazard table.

TABLE 3-7.3
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - TRESPASSER
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Receptor Population: Trespasser
Receptor Age: Adolescent (ages 7-<16)

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Soil	Surface Soil	On-Project Blue Beach Area	Incidental Ingestion	**Inorganics**													
				Antimony	3.80E-01	mg/kg	7.91E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	6.15E-08	mg/kg-day	4.00E-04	mg/kg-day	1.5E-04
				Cadmium	2.17E+00	mg/kg	4.52E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.52E-07	mg/kg-day	1.00E-03	mg/kg-day	3.5E-04
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	6.45E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.3E-08	5.02E-08	mg/kg-day	2.00E-05	mg/kg-day	2.5E-03
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	6.43E-10	mg/kg-day	1.00E+00	kg-day/mg	3	1.9E-09	5.00E-09	mg/kg-day	N/A	mg/kg-day	N/A
			Exp. Route Total									1E-08					3E-03
			Dermal														
				Inorganics													
				Antimony	3.80E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	6.00E-05	mg/kg-day	N/A
				Cadmium	2.17E+00	mg/kg	1.15E-10	mg/kg-day	N/A	kg-day/mg	N/A	N/A	8.92E-10	mg/kg-day	2.50E-05	mg/kg-day	3.6E-05
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	2.29E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	4.6E-09	1.78E-08	mg/kg-day	2.00E-05	mg/kg-day	8.9E-04
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	2.12E-10	mg/kg-day	1.00E+00	kg-day/mg	3	6.4E-10	1.65E-09	mg/kg-day	N/A	mg/kg-day	N/A
			Exp. Route Total									5E-09					9E-04
	Fugitive Dust/ Particulates and Volatiles from Surface Soil	On-Project Blue Beach Area	Inhalation	**Inorganics**													
				Antimony	3.80E-01	mg/kg	2.13E-10	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	1.66E-09	ug/m^3	3.00E-01	ug/m^3	5.5E-09
				Cadmium	2.17E+00	mg/kg	1.22E-09	ug/m^3	1.80E-03	$(ug/m^3)^{-1}$	N/A	2.2E-12	9.48E-09	ug/m^3	1.00E-02	ug/m^3	9.5E-07
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	1.17E-06	ug/m^3	5.70E-04	$(ug/m^3)^{-1}$	N/A	6.7E-10	9.13E-06	ug/m^3	N/A	ug/m^3	N/A
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	1.73E-11	ug/m^3	6.00E-04	$(ug/m^3)^{-1}$	3	3.1E-14	1.35E-10	ug/m^3	N/A	ug/m^3	N/A
			Exp. Route Total									7E-10					1E-06
Surface Soil Total												**2E-08**					**4E-03**

TABLE 3-7.3
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - TRESPASSER
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Receptor Population: Trespasser
Receptor Age: Adolescent (ages 7-<16)

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Soil	Subsurface Soil	On-Project Blue Beach Area	Incidental Ingestion	**Inorganics**													
				Antimony	3.51E-01	mg/kg	7.31E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	5.68E-08	mg/kg-day	4.00E-04	mg/kg-day	1.4E-04
				Cadmium	2.12E+00	mg/kg	4.41E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.43E-07	mg/kg-day	1.00E-03	mg/kg-day	3.4E-04
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	2.71E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	5.4E-09	2.10E-08	mg/kg-day	2.00E-05	mg/kg-day	1.1E-03
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	2.39E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.86E-06	mg/kg-day	1.00E-02	mg/kg-day	1.9E-04
				Ethylbenzene	1.60E+01	mg/kg	3.33E-07	mg/kg-day	1.10E-02	kg-day/mg	N/A	3.7E-09	2.59E-06	mg/kg-day	1.00E-01	mg/kg-day	2.6E-05
				Total Xylenes	1.01E+02	mg/kg	2.10E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.64E-05	mg/kg-day	2.00E-01	mg/kg-day	8.2E-05
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	1.54E-08	mg/kg-day	9.30E-03	kg-day/mg	3	4.3E-10	1.20E-07	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	1.54E-08	mg/kg-day	3.70E-02	kg-day/mg	N/A	5.7E-10	1.20E-07	mg/kg-day	5.00E-04	mg/kg-day	2.4E-04
			Exp. Route Total									1E-08					2E-03
			Dermal														
				Inorganics													
				Antimony	3.51E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	6.00E-05	mg/kg-day	N/A
				Cadmium	2.12E+00	mg/kg	1.12E-10	mg/kg-day	N/A	kg-day/mg	N/A	N/A	8.70E-10	mg/kg-day	2.50E-05	mg/kg-day	3.5E-05
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	9.61E-10	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.9E-09	7.47E-09	mg/kg-day	2.00E-05	mg/kg-day	3.7E-04
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-02	mg/kg-day	N/A
				Ethylbenzene	1.60E+01	mg/kg	N/A	mg/kg-day	1.10E-02	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-01	mg/kg-day	N/A
				Total Xylenes	1.01E+02	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	2.00E-01	mg/kg-day	N/A
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	N/A	mg/kg-day	9.30E-03	kg-day/mg	3	N/A	N/A	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	N/A	mg/kg-day	3.70E-02	kg-day/mg	N/A	N/A	N/A	mg/kg-day	5.00E-04	mg/kg-day	N/A
			Exp. Route Total									2E-09					4E-04
	Fugitive Dust/ Particulates and Volatiles from Subsurface Soil	On-Project Blue Beach Area	Inhalation	**Inorganics**													
				Antimony	3.51E-01	mg/kg	1.97E-10	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	1.53E-09	ug/m^3	3.00E-01	ug/m^3	5.1E-09
				Cadmium	2.12E+00	mg/kg	1.19E-09	ug/m^3	1.80E-03	$(ug/m^3)^{-1}$	N/A	2.1E-12	9.24E-09	ug/m^3	1.00E-02	ug/m^3	9.2E-07
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	4.92E-07	ug/m^3	5.70E-04	$(ug/m^3)^{-1}$	N/A	2.8E-10	3.83E-06	ug/m^3	N/A	ug/m^3	N/A
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	2.92E-03	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	2.27E-02	ug/m^3	6.00E+01	ug/m^3	3.8E-04
				Ethylbenzene	1.60E+01	mg/kg	5.68E-03	ug/m^3	2.50E-06	$(ug/m^3)^{-1}$	N/A	1.4E-08	4.42E-02	ug/m^3	1.00E+03	ug/m^3	4.4E-05
				Total Xylenes	1.01E+02	mg/kg	3.54E-02	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	2.76E-01	ug/m^3	1.00E+02	ug/m^3	2.8E-03
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	6.76E-04	ug/m^3	1.00E-06	$(ug/m^3)^{-1}$	3	2.0E-09	5.26E-03	ug/m^3	N/A	ug/m^3	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	6.76E-04	ug/m^3	3.10E-06	$(ug/m^3)^{-1}$	N/A	2.1E-09	5.26E-03	ug/m^3	2.00E+00	ug/m^3	2.6E-03
			Exp. Route Total									2E-08					6E-03
Subsurface Soil Total												**3E-08**					**8E-03**
Total Receptor Risk/Hazard												(2)					(2)

TABLE 3-7.3
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - TRESPASSER
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Receptor Population: Trespasser
Receptor Age: Adolescent (ages 7-<16)

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient

Notes:
< = less than.
ADAF = Age-dependent adjustment factor.
CSF = Cancer slope factor.
EPC = Exposure point concentration.
IUR = Inhalation unit risk factor.
N/A = Not applicable.
NHL = Non-Hodgkin's lymphoma.
PCBs = Polychlorinated biphenyls.
RfC = Inhalation reference concentration.
RfD = Oral reference dose.
RME = Reasonable Maximum Exposure.
SVOCs = Semivolatile organic compounds.
VOCs = Volatile organic compounds.
(1) ADAF is used for chemicals with a mutagenic mode of action for carcinogenesis. The cancer risk is adjusted by multiplying the calculated risk by the ADAF.
(2) Presented on corresponding summary of risk/hazard table.

TABLE 3-7.4
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - RECREATIONAL USER (ADULT)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Receptor Population: Recreational User
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Soil	Surface Soil	Off-Project Red Maple Swamp/Tidal Stream Area	Incidental Ingestion	**PCBs**													
				Total PCB Aroclors	2.50E-01	mg/kg	6.36E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.3E-08	2.23E-08	mg/kg-day	2.00E-05	mg/kg-day	1.1E-03
			Exp. Route Total									1E-08					1E-03
			Dermal	**PCBs**													
				Total PCB Aroclors	2.50E-01	mg/kg	3.76E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	7.5E-09	1.32E-08	mg/kg-day	2.00E-05	mg/kg-day	6.6E-04
			Exp. Route Total									8E-09					7E-04
	Fugitive Dust/ Particulates and Volatiles from Surface Soil	Off-Project Red Maple Swamp/Tidal Stream Area	Inhalation	**PCBs**													
				Total PCB Aroclors	2.50E-01	mg/kg	4.06E-07	ug/m^3	5.70E-04	(ug/m^3)$^{-1}$	N/A	2.3E-10	1.42E-06	ug/m^3	N/A	ug/m^3	N/A
			Exp. Route Total									2E-10					N/A
Surface Soil Total												**2E-08**					**2E-03**
Soil	Subsurface Soil	Off-Project Red Maple Swamp/Tidal Stream Area	Incidental Ingestion	**Inorganics**													
				Arsenic	5.99E+00	mg/kg	9.15E-08	mg/kg-day	1.50E+00	kg-day/mg	N/A	1.4E-07	3.20E-07	mg/kg-day	3.00E-04	mg/kg-day	1.1E-03
				SVOCs													
				Benzo(a)Pyrene	8.60E-01	mg/kg	2.19E-08	mg/kg-day	1.00E+00	kg-day/mg	1	2.2E-08	7.66E-08	mg/kg-day	3.00E-04	mg/kg-day	2.6E-04
				VOCs													
				Ethylbenzene	3.17E+00	mg/kg	8.06E-08	mg/kg-day	1.10E-02	kg-day/mg	N/A	8.9E-10	2.82E-07	mg/kg-day	1.00E-01	mg/kg-day	2.8E-06
				Naphthalene	8.69E+00	mg/kg	2.21E-07	mg/kg-day	1.20E-01	kg-day/mg	N/A	2.7E-08	7.74E-07	mg/kg-day	2.00E-02	mg/kg-day	3.9E-05
			Exp. Route Total									2E-07					1E-03
			Dermal	**Inorganics**													
				Arsenic	5.99E+00	mg/kg	1.93E-08	mg/kg-day	1.50E+00	kg-day/mg	N/A	2.9E-08	6.76E-08	mg/kg-day	3.00E-04	mg/kg-day	2.3E-04
				SVOCs													
				Benzo(a)Pyrene	8.60E-01	mg/kg	1.20E-08	mg/kg-day	1.00E+00	kg-day/mg	1	1.2E-08	4.20E-08	mg/kg-day	3.00E-04	mg/kg-day	1.4E-04
				VOCs													
				Ethylbenzene	3.17E+00	mg/kg	N/A	mg/kg-day	1.10E-02	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-01	mg/kg-day	N/A
				Naphthalene	8.69E+00	mg/kg	1.21E-07	mg/kg-day	1.20E-01	kg-day/mg	N/A	1.5E-08	4.25E-07	mg/kg-day	2.00E-02	mg/kg-day	2.1E-05
			Exp. Route Total									6E-08					4E-04
	Fugitive Dust/ Particulates and Volatiles from Subsurface Soil	Off-Project Red Maple Swamp/Tidal Stream Area	Inhalation	**Inorganics**													
				Arsenic	5.99E+00	mg/kg	3.74E-09	ug/m^3	4.30E-03	(ug/m^3)$^{-1}$	N/A	1.6E-11	1.31E-08	ug/m^3	1.50E-02	ug/m^3	8.7E-07
				SVOCs													
				Benzo(a)Pyrene	8.60E-01	mg/kg	5.36E-10	ug/m^3	6.00E-04	(ug/m^3)$^{-1}$	1	3.2E-13	1.88E-09	ug/m^3	2.00E-03	ug/m^3	9.4E-07
				VOCs													
				Ethylbenzene	3.17E+00	mg/kg	4.84E-04	ug/m^3	2.50E-06	(ug/m^3)$^{-1}$	N/A	1.2E-09	1.69E-03	ug/m^3	1.00E+03	ug/m^3	1.7E-06
				Naphthalene	8.69E+00	mg/kg	1.62E-04	ug/m^3	3.40E-05	(ug/m^3)$^{-1}$	N/A	5.5E-09	5.67E-04	ug/m^3	3.00E+00	ug/m^3	1.9E-04
			Exp. Route Total									7E-09					2E-04
Subsurface Soil Total												**2E-07**					**2E-03**

TABLE 3-7.4
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - RECREATIONAL USER (ADULT)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Receptor Population: Recreational User
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR			Cancer	Intake/Exposure Concentration		RfD or RfC		Hazard
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Risk	Value	Units	Value	Units	Quotient
Hydric Soil	Hydric Surface Soil	Off-Project Red Maple Swamp/Tidal Stream Area	Incidental Ingestion	**Inorganics**													
				Arsenic	1.06E+01	mg/kg	1.61E-08	mg/kg-day	1.50E+00	kg-day/mg	N/A	2.4E-08	5.64E-08	mg/kg-day	3.00E-04	mg/kg-day	1.9E-04
				Thallium	1.74E-01	mg/kg	4.43E-10	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.55E-09	mg/kg-day	1.00E-05	mg/kg-day	1.5E-04
				PCBs													
				Total PCB Aroclors	1.01E+00	mg/kg	2.56E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	5.1E-09	8.97E-09	mg/kg-day	2.00E-05	mg/kg-day	4.5E-04
				SVOCs													
				Benzo(a)Pyrene	1.85E+00	mg/kg	4.70E-09	mg/kg-day	1.00E+00	kg-day/mg	1	4.7E-09	1.65E-08	mg/kg-day	3.00E-04	mg/kg-day	5.5E-05
				Benzo(b)fluoranthene	2.35E+00	mg/kg	5.98E-09	mg/kg-day	1.00E-01	kg-day/mg	1	6.0E-10	2.09E-08	mg/kg-day	N/A	mg/kg-day	N/A
				Dibenzo(a,h)Anthracene	3.53E-01	mg/kg	8.98E-10	mg/kg-day	1.00E+00	kg-day/mg	1	9.0E-10	3.14E-09	mg/kg-day	N/A	mg/kg-day	N/A
				Indeno(1,2,3-CD)Pyrene	2.72E+00	mg/kg	6.91E-09	mg/kg-day	1.00E-01	kg-day/mg	1	6.9E-10	2.42E-08	mg/kg-day	N/A	mg/kg-day	N/A
			Exp. Route Total									4E-08					8E-04
			Dermal														
				Inorganics													
				Arsenic	1.06E+01	mg/kg	3.40E-08	mg/kg-day	1.50E+00	kg-day/mg	N/A	5.1E-08	1.19E-07	mg/kg-day	3.00E-04	mg/kg-day	4.0E-04
				Thallium	1.74E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-05	mg/kg-day	N/A
				PCBs													
				Total PCB Aroclors	1.01E+00	mg/kg	1.51E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	3.0E-08	5.30E-08	mg/kg-day	2.00E-05	mg/kg-day	2.7E-03
				SVOCs													
				Benzo(a)Pyrene	1.85E+00	mg/kg	2.58E-08	mg/kg-day	1.00E+00	kg-day/mg	1	2.6E-08	9.03E-08	mg/kg-day	3.00E-04	mg/kg-day	3.0E-04
				Benzo(b)fluoranthene	2.35E+00	mg/kg	3.28E-08	mg/kg-day	1.00E-01	kg-day/mg	1	3.3E-09	1.15E-07	mg/kg-day	N/A	mg/kg-day	N/A
				Dibenzo(a,h)Anthracene	3.53E-01	mg/kg	4.93E-09	mg/kg-day	1.00E+00	kg-day/mg	1	4.9E-09	1.73E-08	mg/kg-day	N/A	mg/kg-day	N/A
				Indeno(1,2,3-CD)Pyrene	2.72E+00	mg/kg	3.79E-08	mg/kg-day	1.00E-01	kg-day/mg	1	3.8E-09	1.33E-07	mg/kg-day	N/A	mg/kg-day	N/A
			Exp. Route Total									1E-07					3E-03
Hydric Surface Soil Total												**2E-07**					**4E-03**
Hydric Soil	Hydric Subsurface Soil	Off-Project Red Maple Swamp/Tidal Stream Area	Incidental Ingestion	**Inorganics**													
				Thallium	1.14E-01	mg/kg	2.90E-10	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.02E-09	mg/kg-day	1.00E-05	mg/kg-day	1.0E-04
				PCBs													
				Total PCB Aroclors	2.20E+00	mg/kg	5.60E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.1E-08	1.96E-08	mg/kg-day	2.00E-05	mg/kg-day	9.8E-04
			Exp. Route Total									1E-08					1E-03
			Dermal														
				Inorganics													
				Thallium	1.14E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-05	mg/kg-day	N/A
				PCBs													
				Total PCB Aroclors	2.20E+00	mg/kg	3.31E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	6.6E-08	1.16E-07	mg/kg-day	2.00E-05	mg/kg-day	5.8E-03
			Exp. Route Total									7E-08					6E-03
Hydric Subsurface Soil Total												**8E-08**					**7E-03**

TABLE 3-7.4
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - RECREATIONAL USER (ADULT)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Receptor Population: Recreational User
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Sediment	Sediment	Off-Project Red Maple Swamp/Tidal Stream Area	Incidental Ingestion	**PCBs**													
				Total PCB Aroclors	4.41E-01	mg/kg	1.12E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	2.2E-09	3.93E-09	mg/kg-day	2.00E-05	mg/kg-day	2.0E-04
			Exp. Route Total									2E-09					2E-04
			Dermal	**PCBs**													
				Total PCB Aroclors	4.41E-01	mg/kg	6.63E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.3E-08	2.32E-08	mg/kg-day	2.00E-05	mg/kg-day	1.2E-03
			Exp. Route Total									1E-08					1E-03
Sediment Total												**2E-08**					**1E-03**
Surface Water	Surface Water	Off-Project Red Maple Swamp/Tidal Stream Area	Dermal	**VOCs**													
				1,2,3-Trichlorobenzene	1.20E-01	ug/L	3.96E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.39E-07	mg/kg-day	8.00E-04	mg/kg-day	1.7E-04
				Naphthalene	1.80E-01	ug/L	2.66E-08	mg/kg-day	1.20E-01	kg-day/mg	N/A	3.2E-09	9.30E-08	mg/kg-day	2.00E-02	mg/kg-day	4.7E-06
			Exp. Route Total									3E-09					2E-04
Surface Water Total												**3E-09**					**2E-04**
Total Receptor Risk/Hazard												(2)					(2)

Notes:
ADAF = Age-dependent adjustment factor.
CSF = Cancer slope factor.
EPC = Exposure point concentration.
IUR = Inhalation unit risk factor.
N/A = Not applicable.
PCBs = Polychlorinated biphenyls.
RfC = Inhalation reference concentration.
RfD = Oral reference dose.
RME = Reasonable Maximum Exposure.
SVOCs = Semivolatile organic compounds.
VOCs = Volatile organic compounds.
(1) ADAF is used for chemicals with a mutagenic mode of action for carcinogenesis. The cancer risk is adjusted by multiplying the calculated risk by the ADAF.
(2) Presented on corresponding summary of risk/hazard table.

TABLE 3-7.5
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - RECREATIONAL USER (CHILD)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Receptor Population: Recreational User
Receptor Age: Child

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF (1)	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Soil	Surface Soil	Off-Project Red Maple Swamp/Tidal Stream Area	Incidental Ingestion	**PCBs**													
				Total PCB Aroclors	2.50E-01	mg/kg	2.04E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	4.1E-08	2.37E-07	mg/kg-day	2.00E-05	mg/kg-day	1.2E-02
			Exp. Route Total									4E-08					1E-02
			Dermal	**PCBs**													
				Total PCB Aroclors	2.50E-01	mg/kg	6.76E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.4E-08	7.89E-08	mg/kg-day	2.00E-05	mg/kg-day	3.9E-03
			Exp. Route Total									1E-08					4E-03
	Fugitive Dust/ Particulates and Volatiles from Surface Soil	Off-Project Red Maple Swamp/Tidal Stream Area	Inhalation	**PCBs**													
				Total PCB Aroclors	2.50E-01	mg/kg	1.22E-07	ug/m^3	5.70E-04	(ug/m^3)$^{-1}$	N/A	7.0E-11	1.42E-06	ug/m^3	N/A	ug/m^3	N/A
			Exp. Route Total									7E-11					N/A
Surface Soil Total												**5E-08**					**2E-02**
Soil	Subsurface Soil	Off-Project Red Maple Swamp/Tidal Stream Area	Incidental Ingestion	**Inorganics**													
				Arsenic	5.99E+00	mg/kg	2.93E-07	mg/kg-day	1.50E+00	kg-day/mg	N/A	4.4E-07	3.42E-06	mg/kg-day	3.00E-04	mg/kg-day	1.1E-02
				SVOCs													
				Benzo(a)Pyrene	8.60E-01	mg/kg	7.00E-08	mg/kg-day	1.00E+00	kg-day/mg	5.3	3.7E-07	8.17E-07	mg/kg-day	3.00E-04	mg/kg-day	2.7E-03
				VOCs													
				Ethylbenzene	3.17E+00	mg/kg	2.58E-07	mg/kg-day	1.10E-02	kg-day/mg	N/A	2.8E-09	3.01E-06	mg/kg-day	1.00E-01	mg/kg-day	3.0E-05
				Naphthalene	8.69E+00	mg/kg	7.07E-07	mg/kg-day	1.20E-01	kg-day/mg	N/A	8.5E-08	8.25E-06	mg/kg-day	2.00E-02	mg/kg-day	4.1E-04
			Exp. Route Total									9E-07					1E-02
			Dermal	**Inorganics**													
				Arsenic	5.99E+00	mg/kg	3.47E-08	mg/kg-day	1.50E+00	kg-day/mg	N/A	5.2E-08	4.05E-07	mg/kg-day	3.00E-04	mg/kg-day	1.4E-03
				SVOCs													
				Benzo(a)Pyrene	8.60E-01	mg/kg	2.16E-08	mg/kg-day	1.00E+00	kg-day/mg	5.3	1.1E-07	2.52E-07	mg/kg-day	3.00E-04	mg/kg-day	8.4E-04
				VOCs													
				Ethylbenzene	3.17E+00	mg/kg	N/A	mg/kg-day	1.10E-02	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-01	mg/kg-day	N/A
				Naphthalene	8.69E+00	mg/kg	2.18E-07	mg/kg-day	1.20E-01	kg-day/mg	N/A	2.6E-08	2.55E-06	mg/kg-day	2.00E-02	mg/kg-day	1.3E-04
			Exp. Route Total									2E-07					2E-03
	Fugitive Dust/ Particulates and Volatiles from Subsurface Soil	Off-Project Red Maple Swamp/Tidal Stream Area	Inhalation	**Inorganics**													
				Arsenic	5.99E+00	mg/kg	1.12E-09	ug/m^3	4.30E-03	(ug/m^3)$^{-1}$	N/A	4.8E-12	1.31E-08	ug/m^3	1.50E-02	ug/m^3	8.7E-07
				SVOCs													
				Benzo(a)Pyrene	8.60E-01	mg/kg	1.61E-10	ug/m^3	6.00E-04	(ug/m^3)$^{-1}$	5.3	5.1E-13	1.88E-09	ug/m^3	2.00E-03	ug/m^3	9.4E-07
				VOCs													
				Ethylbenzene	3.17E+00	mg/kg	1.45E-04	ug/m^3	2.50E-06	(ug/m^3)$^{-1}$	N/A	3.6E-10	1.69E-03	ug/m^3	1.00E+03	ug/m^3	1.7E-06
				Naphthalene	8.69E+00	mg/kg	4.86E-05	ug/m^3	3.40E-05	(ug/m^3)$^{-1}$	N/A	1.7E-09	5.67E-04	ug/m^3	3.00E+00	ug/m^3	1.9E-04
			Exp. Route Total									2E-09					2E-04
Subsurface Soil Total												**1E-06**					**2E-02**

TABLE 3-7.5
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - RECREATIONAL USER (CHILD)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Receptor Population: Recreational User
Receptor Age: Child

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF (1)	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Hydric Soil	Hydric Surface Soil	Off-Project Red Maple Swamp/Tidal Stream Area	Incidental Ingestion	**Inorganics**													
				Arsenic	1.06E+01	mg/kg	5.15E-08	mg/kg-day	1.50E+00	kg-day/mg	N/A	7.7E-08	6.01E-07	mg/kg-day	3.00E-04	mg/kg-day	2.0E-03
				Thallium	1.74E-01	mg/kg	1.42E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.65E-08	mg/kg-day	1.00E-05	mg/kg-day	1.7E-03
				PCBs													
				Total PCB Aroclors	1.01E+00	mg/kg	8.20E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.6E-08	9.56E-08	mg/kg-day	2.00E-05	mg/kg-day	4.8E-03
				SVOCs													
				Benzo(a)Pyrene	1.85E+00	mg/kg	1.50E-08	mg/kg-day	1.00E+00	kg-day/mg	5.3	8.0E-08	1.76E-07	mg/kg-day	3.00E-04	mg/kg-day	5.9E-04
				Benzo(b)fluoranthene	2.35E+00	mg/kg	1.91E-08	mg/kg-day	1.00E-01	kg-day/mg	5.3	1.0E-08	2.23E-07	mg/kg-day	N/A	mg/kg-day	N/A
				Dibenzo(a,h)Anthracene	3.53E-01	mg/kg	2.87E-09	mg/kg-day	1.00E+00	kg-day/mg	5.3	1.5E-08	3.35E-08	mg/kg-day	N/A	mg/kg-day	N/A
				Indeno(1,2,3-CD)Pyrene	2.72E+00	mg/kg	2.21E-08	mg/kg-day	1.00E-01	kg-day/mg	5.3	1.2E-08	2.58E-07	mg/kg-day	N/A	mg/kg-day	N/A
			Exp. Route Total									2E-07					9E-03
			Dermal														
				Inorganics													
				Arsenic	1.06E+01	mg/kg	6.11E-08	mg/kg-day	1.50E+00	kg-day/mg	N/A	9.2E-08	7.13E-07	mg/kg-day	3.00E-04	mg/kg-day	2.4E-03
				Thallium	1.74E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-05	mg/kg-day	N/A
				PCBs													
				Total PCB Aroclors	1.01E+00	mg/kg	2.72E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	5.4E-08	3.18E-07	mg/kg-day	2.00E-05	mg/kg-day	1.6E-02
				SVOCs													
				Benzo(a)Pyrene	1.85E+00	mg/kg	4.64E-08	mg/kg-day	1.00E+00	kg-day/mg	5.3	2.5E-07	5.41E-07	mg/kg-day	3.00E-04	mg/kg-day	1.8E-03
				Benzo(b)fluoranthene	2.35E+00	mg/kg	5.90E-08	mg/kg-day	1.00E-01	kg-day/mg	5.3	3.1E-08	6.88E-07	mg/kg-day	N/A	mg/kg-day	N/A
				Dibenzo(a,h)Anthracene	3.53E-01	mg/kg	8.87E-09	mg/kg-day	1.00E+00	kg-day/mg	5.3	4.7E-08	1.03E-07	mg/kg-day	N/A	mg/kg-day	N/A
				Indeno(1,2,3-CD)Pyrene	2.72E+00	mg/kg	6.82E-08	mg/kg-day	1.00E-01	kg-day/mg	5.3	3.6E-08	7.96E-07	mg/kg-day	N/A	mg/kg-day	N/A
			Exp. Route Total									5E-07					2E-02
Hydric Surface Soil Total												**7E-07**					**3E-02**
Hydric Soil	Hydric Subsurface Soil	Off-Project Red Maple Swamp/Tidal Stream Area	Incidental Ingestion	**Inorganics**													
				Thallium	1.74E-01	mg/kg	1.42E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.65E-08	mg/kg-day	1.00E-05	mg/kg-day	1.7E-03
				PCBs													
				Total PCB Aroclors	1.01E+00	mg/kg	8.20E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.6E-08	9.56E-08	mg/kg-day	2.00E-05	mg/kg-day	4.8E-03
			Exp. Route Total									2E-08					6E-03
			Dermal														
				Inorganics													
				Thallium	1.74E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-05	mg/kg-day	N/A
				PCBs													
				Total PCB Aroclors	1.01E+00	mg/kg	2.72E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	5.4E-08	3.18E-07	mg/kg-day	2.00E-05	mg/kg-day	1.6E-02
			Exp. Route Total									5E-08					2E-02
Hydric Subsurface Soil Total												**7E-08**					**2E-02**

TABLE 3-7.5
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - RECREATIONAL USER (CHILD)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future; Future
Receptor Population: Recreational User
Receptor Age: Child

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF (1)	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Sediment	Sediment	Off-Project Red Maple Swamp/Tidal Stream Area	Incidental Ingestion	**PCBs**													
				Total PCB Aroclors	4.41E-01	mg/kg	3.59E-09	mg/kg-day	2.00E+00	kg-day/mg	N/A	7.2E-09	4.19E-08	mg/kg-day	2.00E-05	mg/kg-day	2.1E-03
			Exp. Route Total									7E-09					2E-03
			Dermal	**PCBs**													
				Total PCB Aroclors	4.41E-01	mg/kg	1.19E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	2.4E-08	1.39E-07	mg/kg-day	2.00E-05	mg/kg-day	7.0E-03
			Exp. Route Total									2E-08					7E-03
Sediment Total												**3E-08**					**9E-03**
Surface Water	Surface Water	Off-Project Red Maple Swamp/Tidal Stream Area	Dermal	**VOCs**													
				1,2,3-Trichlorobenzene	1.20E-01	ug/L	2.49E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.91E-07	mg/kg-day	8.00E-04	mg/kg-day	3.6E-04
				Naphthalene	1.80E-01	ug/L	1.67E-08	mg/kg-day	1.20E-01	kg-day/mg	N/A	2.0E-09	1.95E-07	mg/kg-day	2.00E-02	mg/kg-day	9.8E-06
			Exp. Route Total									2E-09					4E-04
Surface Water Total												**2E-09**					**4E-04**
Total Receptor Risk/Hazard												(2)					(2)

Notes:
ADAF = Age-dependent adjustment factor.
CSF = Cancer slope factor.
EPC = Exposure point concentration.
IUR = Inhalation unit risk factor.
N/A = Not applicable.
PCBs = Polychlorinated biphenyls.
RfC = Inhalation reference concentration.
RfD = Oral reference dose.
RME = Reasonable Maximum Exposure.
SVOCs = Semivolatile organic compounds.
VOCs = Volatile organic compounds.
(1) ADAF is used for chemicals with a mutagenic mode of action for carcinogenesis. The cancer risk is adjusted by multiplying the calculated risk by the ADAF.
A combined, age-weighted ADAF of 5.3 [$ADAF_{0-<2\ years}$ (10) × (2 years/6 years) + $ADAF_{2-<6\ years}$ (3) × (4 years/6 years)] is used.
(2) Presented on corresponding summary of risk/hazard table.

TABLE 3-7.6
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - HYPOTHETICAL FUTURE RESIDENT (ADULT)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Soil	Surface Soil	On-Project Blue Beach Area	Incidental Ingestion	**Inorganics**													
				Antimony	3.80E-01	mg/kg	1.30E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	4.55E-07	mg/kg-day	4.00E-04	mg/kg-day	1.1E-03
				Cadmium	2.17E+00	mg/kg	7.44E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.60E-06	mg/kg-day	1.00E-03	mg/kg-day	2.6E-03
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	1.06E-07	mg/kg-day	2.00E+00	kg-day/mg	N/A	2.1E-07	3.72E-07	mg/kg-day	2.00E-05	mg/kg-day	1.9E-02
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	1.06E-08	mg/kg-day	1.00E+00	kg-day/mg	1	1.1E-08	3.70E-08	mg/kg-day	N/A	mg/kg-day	N/A
			Exp. Route Total									2E-07					2E-02
			Dermal														
				Inorganics													
				Antimony	3.80E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	6.00E-05	mg/kg-day	N/A
				Cadmium	2.17E+00	mg/kg	3.14E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.10E-08	mg/kg-day	2.50E-05	mg/kg-day	4.4E-04
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	6.28E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	1.3E-07	2.20E-07	mg/kg-day	2.00E-05	mg/kg-day	1.1E-02
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	5.81E-09	mg/kg-day	1.00E+00	kg-day/mg	1	5.8E-09	2.03E-08	mg/kg-day	N/A	mg/kg-day	N/A
			Exp. Route Total									1E-07					1E-02
	Fugitive Dust/ Particulates and Volatiles from Surface Soil	On-Project Blue Beach Area	Inhalation	**Inorganics**													
				Antimony	3.80E-01	mg/kg	7.66E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	2.68E-07	ug/m^3	3.00E-01	ug/m^3	8.9E-07
				Cadmium	2.17E+00	mg/kg	4.38E-07	ug/m^3	1.80E-03	$(ug/m^3)^{-1}$	N/A	7.9E-10	1.53E-06	ug/m^3	1.00E-02	ug/m^3	1.5E-04
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	2.48E-04	ug/m^3	5.70E-04	$(ug/m^3)^{-1}$	N/A	1.4E-07	8.67E-04	ug/m^3	N/A	ug/m^3	N/A
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	6.22E-09	ug/m^3	6.00E-04	$(ug/m^3)^{-1}$	1	3.7E-12	2.18E-08	ug/m^3	N/A	ug/m^3	N/A
			Exp. Route Total									1E-07					2E-04
Surface Soil Total												**5E-07**					**3E-02**

TABLE 3-7.6
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - HYPOTHETICAL FUTURE RESIDENT (ADULT)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Soil	Subsurface Soil	On-Project Blue Beach Area	Incidental Ingestion	**Inorganics**													
				Antimony	3.51E-01	mg/kg	1.20E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	4.21E-07	mg/kg-day	4.00E-04	mg/kg-day	1.1E-03
				Cadmium	2.12E+00	mg/kg	7.25E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.54E-06	mg/kg-day	1.00E-03	mg/kg-day	2.5E-03
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	4.45E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	8.9E-08	1.56E-07	mg/kg-day	2.00E-05	mg/kg-day	7.8E-03
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	3.93E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.38E-05	mg/kg-day	1.00E-02	mg/kg-day	1.4E-03
				Ethylbenzene	1.60E+01	mg/kg	5.48E-06	mg/kg-day	1.10E-02	kg-day/mg	N/A	6.0E-08	1.92E-05	mg/kg-day	1.00E-01	mg/kg-day	1.9E-04
				Total Xylenes	1.01E+02	mg/kg	3.46E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.21E-04	mg/kg-day	2.00E-01	mg/kg-day	6.1E-04
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	2.54E-07	mg/kg-day	9.30E-03	kg-day/mg	1	2.4E-09	8.88E-07	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	2.54E-07	mg/kg-day	3.70E-02	kg-day/mg	N/A	9.4E-09	8.88E-07	mg/kg-day	5.00E-04	mg/kg-day	1.8E-03
			Exp. Route Total									2E-07					2E-02
			Dermal														
				Inorganics													
				Antimony	3.51E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	6.00E-05	mg/kg-day	N/A
				Cadmium	2.12E+00	mg/kg	3.06E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.07E-08	mg/kg-day	2.50E-05	mg/kg-day	4.3E-04
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	2.63E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	5.3E-08	9.21E-08	mg/kg-day	2.00E-05	mg/kg-day	4.6E-03
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-02	mg/kg-day	N/A
				Ethylbenzene	1.60E+01	mg/kg	N/A	mg/kg-day	1.10E-02	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-01	mg/kg-day	N/A
				Total Xylenes	1.01E+02	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	2.00E-01	mg/kg-day	N/A
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	N/A	mg/kg-day	9.30E-03	kg-day/mg	1	N/A	N/A	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	N/A	mg/kg-day	3.70E-02	kg-day/mg	N/A	N/A	N/A	mg/kg-day	5.00E-04	mg/kg-day	N/A
			Exp. Route Total									5E-08					5E-03
	Fugitive Dust/ Particulates and Volatiles from Subsurface Soil	On-Project Blue Beach Area	Inhalation	**Inorganics**													
				Antimony	3.51E-01	mg/kg	7.07E-08	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	2.47E-07	ug/m^3	3.00E-01	ug/m^3	8.2E-07
				Cadmium	2.12E+00	mg/kg	4.27E-07	ug/m^3	1.80E-03	(ug/m^3)$^{-1}$	N/A	7.7E-10	1.49E-06	ug/m^3	1.00E-02	ug/m^3	1.5E-04
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	1.04E-04	ug/m^3	5.70E-04	(ug/m^3)$^{-1}$	N/A	5.9E-08	3.64E-04	ug/m^3	N/A	ug/m^3	N/A
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	6.17E-01	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	2.16E+00	ug/m^3	6.00E+01	ug/m^3	3.6E-02
				Ethylbenzene	1.60E+01	mg/kg	1.20E+00	ug/m^3	2.50E-06	(ug/m^3)$^{-1}$	N/A	3.0E-06	4.20E+00	ug/m^3	1.00E+03	ug/m^3	4.2E-03
				Total Xylenes	1.01E+02	mg/kg	7.48E+00	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	2.62E+01	ug/m^3	1.00E+02	ug/m^3	2.6E-01
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	1.43E-01	ug/m^3	1.00E-06	(ug/m^3)$^{-1}$	1	1.4E-07	5.00E-01	ug/m^3	N/A	ug/m^3	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	1.43E-01	ug/m^3	3.10E-06	(ug/m^3)$^{-1}$	N/A	4.4E-07	5.00E-01	ug/m^3	2.00E+00	ug/m^3	2.5E-01
			Exp. Route Total									4E-06					6E-01
Subsurface Soil Total												**4E-06**					**6E-01**

TABLE 3-7.6
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - HYPOTHETICAL FUTURE RESIDENT (ADULT)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Groundwater	Groundwater	On-Project Blue Beach Area	Ingestion	**Inorganics**													
				Antimony	2.22E+00	ug/L	1.90E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	6.65E-05	mg/kg-day	4.00E-04	mg/kg-day	1.7E-01
				Arsenic	2.94E+00	ug/L	2.52E-05	mg/kg-day	1.50E+00	kg-day/mg	N/A	3.8E-05	8.82E-05	mg/kg-day	3.00E-04	mg/kg-day	2.9E-01
				Barium	1.20E+02	ug/L	1.03E-03	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.61E-03	mg/kg-day	2.00E-01	mg/kg-day	1.8E-02
				Cadmium	4.92E+00	ug/L	4.21E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.47E-04	mg/kg-day	5.00E-04	mg/kg-day	2.9E-01
				Chromium	1.07E+02	ug/L	9.19E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.22E-03	mg/kg-day	1.50E+00	mg/kg-day	2.1E-03
				Cobalt	4.19E+00	ug/L	3.59E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.26E-04	mg/kg-day	3.00E-04	mg/kg-day	4.2E-01
				Iron	6.03E+04	ug/L	5.16E-01	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.81E+00	mg/kg-day	7.00E-01	mg/kg-day	2.6E+00
				Lead	See Human Health Risk Assessment Report Text												
				Manganese	3.18E+03	ug/L	2.72E-02	mg/kg-day	N/A	kg-day/mg	N/A	N/A	9.53E-02	mg/kg-day	2.40E-02	mg/kg-day	4.0E+00
				SVOCs													
				1-Methylnaphthalene	9.00E+01	ug/L	7.71E-04	mg/kg-day	2.90E-02	kg-day/mg	N/A	2.2E-05	2.70E-03	mg/kg-day	7.00E-02	mg/kg-day	3.9E-02
				2-Methylnaphthalene	8.50E+01	ug/L	7.28E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.55E-03	mg/kg-day	4.00E-03	mg/kg-day	6.4E-01
				Benzo(a)anthracene	1.38E-01	ug/L	1.18E-06	mg/kg-day	1.00E-01	kg-day/mg	1	1.2E-07	4.14E-06	mg/kg-day	N/A	mg/kg-day	N/A
				Benzo(a)Pyrene	1.41E-01	ug/L	1.21E-06	mg/kg-day	1.00E+00	kg-day/mg	1	1.2E-06	4.23E-06	mg/kg-day	3.00E-04	mg/kg-day	1.4E-02
				Benzo(b)fluoranthene	2.05E-01	ug/L	1.76E-06	mg/kg-day	1.00E-01	kg-day/mg	1	1.8E-07	6.14E-06	mg/kg-day	N/A	mg/kg-day	N/A
				Naphthalene	2.50E+02	ug/L	2.14E-03	mg/kg-day	1.20E-01	kg-day/mg	N/A	2.6E-04	7.49E-03	mg/kg-day	2.00E-02	mg/kg-day	3.7E-01
				VOCs													
				1,1,2,2-Tetrachloroethane	2.00E-01	ug/L	1.71E-06	mg/kg-day	2.00E-01	kg-day/mg	N/A	3.4E-07	5.99E-06	mg/kg-day	2.00E-02	mg/kg-day	3.0E-04
				1,1,2-Trichloroethane	4.00E-01	ug/L	3.42E-06	mg/kg-day	5.70E-02	kg-day/mg	N/A	2.0E-07	1.20E-05	mg/kg-day	4.00E-03	mg/kg-day	3.0E-03
				1,1-Dichloroethane	1.99E-01	ug/L	1.70E-06	mg/kg-day	5.70E-03	kg-day/mg	N/A	9.7E-09	5.96E-06	mg/kg-day	2.00E-01	mg/kg-day	3.0E-05
				1,2,4-Trimethylbenzene	5.84E+01	ug/L	5.00E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.75E-03	mg/kg-day	1.00E-02	mg/kg-day	1.8E-01
				1,2-Dichloropropane	9.40E-01	ug/L	8.05E-06	mg/kg-day	3.70E-02	kg-day/mg	N/A	3.0E-07	2.82E-05	mg/kg-day	4.00E-02	mg/kg-day	7.0E-04
				Chloroform	1.99E-01	ug/L	1.70E-06	mg/kg-day	3.10E-02	kg-day/mg	N/A	5.3E-08	5.96E-06	mg/kg-day	1.00E-02	mg/kg-day	6.0E-04
				cis-1,2-Dichloroethene	7.44E+00	ug/L	6.37E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.23E-04	mg/kg-day	2.00E-03	mg/kg-day	1.1E-01
				Ethylbenzene	8.97E-01	ug/L	7.68E-06	mg/kg-day	1.10E-02	kg-day/mg	N/A	8.4E-08	2.69E-05	mg/kg-day	1.00E-01	mg/kg-day	2.7E-04
				Tetrachloroethene	1.04E+00	ug/L	8.91E-06	mg/kg-day	2.10E-03	kg-day/mg	N/A	1.9E-08	3.12E-05	mg/kg-day	6.00E-03	mg/kg-day	5.2E-03
				Total Xylenes	8.99E+00	ug/L	7.69E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.69E-04	mg/kg-day	2.00E-01	mg/kg-day	1.3E-03
				Trichloroethylene (kidney effects)	3.25E+01	ug/L	2.78E-04	mg/kg-day	9.30E-03	kg-day/mg	1	2.6E-06	9.74E-04	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	3.25E+01	ug/L	2.78E-04	mg/kg-day	3.70E-02	kg-day/mg	N/A	1.0E-05	9.74E-04	mg/kg-day	5.00E-04	mg/kg-day	1.9E+00
				Vinyl Chloride	2.00E+00	ug/L	1.71E-05	mg/kg-day	1.40E+00	kg-day/mg	N/A	2.4E-05	5.99E-05	mg/kg-day	3.00E-03	mg/kg-day	2.0E-02
			Exp. Route Total									4E-04					1E+01

TABLE 3-7.6
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - HYPOTHETICAL FUTURE RESIDENT (ADULT)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Groundwater	Groundwater	On-Project Blue Beach Area	Dermal	**Inorganics**													
				Antimony	2.22E+00	ug/L	1.06E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.71E-07	mg/kg-day	6.00E-05	mg/kg-day	6.2E-03
				Arsenic	2.94E+00	ug/L	1.41E-07	mg/kg-day	1.50E+00	kg-day/mg	N/A	2.1E-07	4.92E-07	mg/kg-day	3.00E-04	mg/kg-day	1.6E-03
				Barium	1.20E+02	ug/L	5.75E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.01E-05	mg/kg-day	1.40E-02	mg/kg-day	1.4E-03
				Cadmium	4.92E+00	ug/L	2.35E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	8.23E-07	mg/kg-day	2.50E-05	mg/kg-day	3.3E-02
				Chromium	1.07E+02	ug/L	5.13E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.79E-05	mg/kg-day	1.95E-02	mg/kg-day	9.2E-04
				Cobalt	4.19E+00	ug/L	8.02E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.81E-07	mg/kg-day	3.00E-04	mg/kg-day	9.4E-04
				Iron	6.03E+04	ug/L	2.88E-03	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.01E-02	mg/kg-day	7.00E-01	mg/kg-day	1.4E-02
				Lead	See Human Health Risk Assessment Report Text												
				Manganese	3.18E+03	ug/L	1.52E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	5.32E-04	mg/kg-day	9.60E-04	mg/kg-day	5.5E-01
				SVOCs													
				1-Methylnaphthalene	9.00E+01	ug/L	1.07E-03	mg/kg-day	2.90E-02	kg-day/mg	N/A	3.1E-05	3.76E-03	mg/kg-day	7.00E-02	mg/kg-day	5.4E-02
				2-Methylnaphthalene	8.50E+01	ug/L	9.98E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.49E-03	mg/kg-day	4.00E-03	mg/kg-day	8.7E-01
				Benzo(a)anthracene	1.38E-01	ug/L	N/A	mg/kg-day	1.00E-01	kg-day/mg	1	N/A	N/A	mg/kg-day	N/A	mg/kg-day	N/A
				Benzo(a)Pyrene	1.41E-01	ug/L	N/A	mg/kg-day	1.00E+00	kg-day/mg	1	N/A	N/A	mg/kg-day	3.00E-04	mg/kg-day	N/A
				Benzo(b)fluoranthene	2.05E-01	ug/L	N/A	mg/kg-day	1.00E-01	kg-day/mg	1	N/A	N/A	mg/kg-day	N/A	mg/kg-day	N/A
				Naphthalene	2.50E+02	ug/L	1.36E-03	mg/kg-day	1.20E-01	kg-day/mg	N/A	1.6E-04	4.78E-03	mg/kg-day	2.00E-02	mg/kg-day	2.4E-01
				VOCs													
				1,1,2,2-Tetrachloroethane	2.00E-01	ug/L	2.10E-07	mg/kg-day	2.00E-01	kg-day/mg	N/A	4.2E-08	7.34E-07	mg/kg-day	2.00E-02	mg/kg-day	3.7E-05
				1,1,2-Trichloroethane	4.00E-01	ug/L	3.12E-07	mg/kg-day	5.70E-02	kg-day/mg	N/A	1.8E-08	1.09E-06	mg/kg-day	4.00E-03	mg/kg-day	2.7E-04
				1,1-Dichloroethane	1.99E-01	ug/L	1.30E-07	mg/kg-day	5.70E-03	kg-day/mg	N/A	7.4E-10	4.55E-07	mg/kg-day	2.00E-01	mg/kg-day	2.3E-06
				1,2,4-Trimethylbenzene	5.84E+01	ug/L	5.56E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.95E-03	mg/kg-day	1.00E-02	mg/kg-day	1.9E-01
				1,2-Dichloropropane	9.40E-01	ug/L	7.74E-07	mg/kg-day	3.70E-02	kg-day/mg	N/A	2.9E-08	2.71E-06	mg/kg-day	4.00E-02	mg/kg-day	6.8E-05
				Chloroform	1.99E-01	ug/L	1.50E-07	mg/kg-day	3.10E-02	kg-day/mg	N/A	4.7E-09	5.26E-07	mg/kg-day	1.00E-02	mg/kg-day	5.3E-05
				cis-1,2-Dichloroethene	7.44E+00	ug/L	7.83E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.74E-05	mg/kg-day	2.00E-03	mg/kg-day	1.4E-02
				Ethylbenzene	8.97E-01	ug/L	4.49E-06	mg/kg-day	1.10E-02	kg-day/mg	N/A	4.9E-08	1.57E-05	mg/kg-day	1.00E-01	mg/kg-day	1.6E-04
				Tetrachloroethene	1.04E+00	ug/L	5.19E-06	mg/kg-day	2.10E-03	kg-day/mg	N/A	1.1E-08	1.82E-05	mg/kg-day	6.00E-03	mg/kg-day	3.0E-03
				Total Xylenes	8.99E+00	ug/L	4.56E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.60E-04	mg/kg-day	2.00E-01	mg/kg-day	8.0E-04
				Trichloroethylene (kidney effects)	3.25E+01	ug/L	4.52E-05	mg/kg-day	9.30E-03	kg-day/mg	1	4.2E-07	1.58E-04	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	3.25E+01	ug/L	4.52E-05	mg/kg-day	3.70E-02	kg-day/mg	N/A	1.7E-06	1.58E-04	mg/kg-day	5.00E-04	mg/kg-day	3.2E-01
				Vinyl Chloride	2.00E+00	ug/L	8.92E-07	mg/kg-day	1.40E+00	kg-day/mg	N/A	1.2E-06	3.12E-06	mg/kg-day	3.00E-03	mg/kg-day	1.0E-03
			Exp. Route Total									2E-04					2E+00

TABLE 3-7.6
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - HYPOTHETICAL FUTURE RESIDENT (ADULT)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF (1)	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Groundwater	Shower Air	On-Project Blue Beach Area	Inhalation	**SVOCs**													
				1-Methylnaphthalene	8.40E+02	ug/m^3	9.68E+00	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	3.39E+01	ug/m^3	N/A	ug/m^3	N/A
				2-Methylnaphthalene	7.95E+02	ug/m^3	9.17E+00	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	3.21E+01	ug/m^3	N/A	ug/m^3	N/A
				Benzo(a)anthracene	8.07E-02	ug/m^3	9.30E-04	ug/m^3	6.00E-05	(ug/m^3)$^{-1}$	1	6E-08	3.26E-03	ug/m^3	N/A	ug/m^3	N/A
				Naphthalene	2.33E+03	ug/m^3	2.69E+01	ug/m^3	3.40E-05	(ug/m^3)$^{-1}$	N/A	9E-04	9.40E+01	ug/m^3	3.00E+00	ug/m^3	3E+01
				VOCs													
				1,1,2,2-Tetrachloroethane	1.56E+00	ug/m^3	1.80E-02	ug/m^3	5.80E-05	(ug/m^3)$^{-1}$	N/A	1E-06	6.31E-02	ug/m^3	N/A	ug/m^3	N/A
				1,1,2-Trichloroethane	4.27E+00	ug/m^3	4.93E-02	ug/m^3	1.60E-05	(ug/m^3)$^{-1}$	N/A	8E-07	1.72E-01	ug/m^3	2.00E-01	ug/m^3	9E-01
				1,1-Dichloroethane	2.84E+00	ug/m^3	3.27E-02	ug/m^3	1.60E-06	(ug/m^3)$^{-1}$	N/A	5E-08	1.15E-01	ug/m^3	N/A	ug/m^3	N/A
				1,2,4-Trimethylbenzene	7.77E+02	ug/m^3	8.96E+00	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	3.13E+01	ug/m^3	6.00E+01	ug/m^3	5E-01
				1,2-Dichloropropane	1.24E+01	ug/m^3	1.43E-01	ug/m^3	3.70E-06	(ug/m^3)$^{-1}$	N/A	5E-07	4.99E-01	ug/m^3	4.00E+00	ug/m^3	1E-01
				Chloroform	2.60E+00	ug/m^3	3.00E-02	ug/m^3	2.30E-05	(ug/m^3)$^{-1}$	N/A	7E-07	1.05E-01	ug/m^3	9.80E+01	ug/m^3	1E-03
				cis-1,2-Dichloroethene	1.06E+02	ug/m^3	1.22E+00	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	4.26E+00	ug/m^3	N/A	ug/m^3	N/A
				Ethylbenzene	1.26E+01	ug/m^3	1.45E-01	ug/m^3	2.50E-06	(ug/m^3)$^{-1}$	N/A	4E-07	5.08E-01	ug/m^3	1.00E+03	ug/m^3	5E-04
				Tetrachloroethene	1.25E+01	ug/m^3	1.44E-01	ug/m^3	2.60E-07	(ug/m^3)$^{-1}$	N/A	4E-08	5.03E-01	ug/m^3	4.00E+01	ug/m^3	1E-02
				Total Xylenes	1.26E+02	ug/m^3	1.45E+00	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	5.07E+00	ug/m^3	1.00E+02	ug/m^3	5E-02
				Trichloroethylene (kidney effects)	4.22E+02	ug/m^3	4.87E+00	ug/m^3	1.00E-06	(ug/m^3)$^{-1}$	1	5E-06	1.70E+01	ug/m^3	N/A	ug/m^3	N/A
				Trichloroethylene (NHL+liver effects)	4.22E+02	ug/m^3	4.87E+00	ug/m^3	3.10E-06	(ug/m^3)$^{-1}$	N/A	2E-05	1.70E+01	ug/m^3	2.00E+00	ug/m^3	9E+00
				Vinyl Chloride	3.44E+01	ug/m^3	3.97E-01	ug/m^3	8.80E-06	(ug/m^3)$^{-1}$	N/A	3E-06	1.39E+00	ug/m^3	1.00E+02	ug/m^3	1E-02
			Exp. Route Total									9E-04					4E+01
Groundwater Total												**1E-03**					**5E+01**
Total Receptor Risk/Hazard												(2)					(2)

Notes:
ADAF = Age-dependent adjustment factor.
CSF = Cancer slope factor.
EPC = Exposure point concentration.
IUR = Inhalation unit risk factor.
N/A = Not applicable.
NHL = Non-Hodgkin's lymphoma.
PCBs = Polychlorinated biphenyls.
RfC = Inhalation reference concentration.
RfD = Oral reference dose.
RME = Reasonable Maximum Exposure.
SVOCs = Semivolatile organic compounds.
VOCs = Volatile organic compounds.
(1) ADAF is used for chemicals with a mutagenic mode of action for carcinogenesis. The cancer risk is adjusted by multiplying the calculated risk by the ADAF. Does not apply to vinyl chloride; addressed based on CSF/IUR. Value for continuous exposure from birth used to evaluate the combined child/adult cancer risk. See report text for explanation.
(2) Presented on corresponding summary of risk/hazard table.

TABLE 3-7.7
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - HYPOTHETICAL FUTURE RESIDENT (CHILD)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Soil	Surface Soil	On-Project Blue Beach Area	Incidental Ingestion	**Inorganics**													
				Antimony	3.80E-01	mg/kg	4.16E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	4.86E-06	mg/kg-day	4.00E-04	mg/kg-day	1.2E-02
				Cadmium	2.17E+00	mg/kg	2.38E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.78E-05	mg/kg-day	1.00E-03	mg/kg-day	2.8E-02
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	3.40E-07	mg/kg-day	2.00E+00	kg-day/mg	N/A	6.8E-07	3.96E-06	mg/kg-day	2.00E-05	mg/kg-day	2.0E-01
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	3.39E-08	mg/kg-day	1.00E+00	kg-day/mg	5.3	1.8E-07	3.95E-07	mg/kg-day	N/A	mg/kg-day	N/A
				Exp. Route Total								9E-07					2E-01
			Dermal														
				Inorganics													
				Antimony	3.80E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	6.00E-05	mg/kg-day	N/A
				Cadmium	2.17E+00	mg/kg	5.65E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	6.59E-08	mg/kg-day	2.50E-05	mg/kg-day	2.6E-03
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	1.13E-07	mg/kg-day	2.00E+00	kg-day/mg	N/A	2.3E-07	1.32E-06	mg/kg-day	2.00E-05	mg/kg-day	6.6E-02
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	1.04E-08	mg/kg-day	1.00E+00	kg-day/mg	5.3	5.5E-08	1.22E-07	mg/kg-day	N/A	mg/kg-day	N/A
				Exp. Route Total								3E-07					7E-02
	Fugitive Dust/ Particulates and Volatiles from Surface Soil	On-Project Blue Beach Area	Inhalation	**Inorganics**													
				Antimony	3.80E-01	mg/kg	2.30E-08	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	2.68E-07	ug/m^3	3.00E-01	ug/m^3	8.9E-07
				Cadmium	2.17E+00	mg/kg	1.31E-07	ug/m^3	1.80E-03	$(ug/m^3)^{-1}$	N/A	2.4E-10	1.53E-06	ug/m^3	1.00E-02	ug/m^3	1.5E-04
				PCBs													
				Total PCB Aroclors	3.10E-01	mg/kg	7.44E-05	ug/m^3	5.70E-04	$(ug/m^3)^{-1}$	N/A	4.2E-08	8.67E-04	ug/m^3	N/A	ug/m^3	N/A
				SVOCs													
				Dibenzo(a,h)Anthracene	3.09E-02	mg/kg	1.87E-09	ug/m^3	6.00E-04	$(ug/m^3)^{-1}$	5.3	5.9E-12	2.18E-08	ug/m^3	N/A	ug/m^3	N/A
				Exp. Route Total								4E-08					2E-04
Surface Soil Total												**1E-06**					**3E-01**

TABLE 3-7.7
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - HYPOTHETICAL FUTURE RESIDENT (CHILD)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Soil	Subsurface Soil	On-Project Blue Beach Area	Incidental Ingestion	**Inorganics**													
				Antimony	3.51E-01	mg/kg	3.85E-07	mg/kg-day	N/A	kg-day/mg	N/A	N/A	4.49E-06	mg/kg-day	4.00E-04	mg/kg-day	1.1E-02
				Cadmium	2.12E+00	mg/kg	2.32E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.71E-05	mg/kg-day	1.00E-03	mg/kg-day	2.7E-02
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	1.42E-07	mg/kg-day	2.00E+00	kg-day/mg	N/A	2.8E-07	1.66E-06	mg/kg-day	2.00E-05	mg/kg-day	8.3E-02
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	1.26E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.47E-04	mg/kg-day	1.00E-02	mg/kg-day	1.5E-02
				Ethylbenzene	1.60E+01	mg/kg	1.75E-05	mg/kg-day	1.10E-02	kg-day/mg	N/A	1.9E-07	2.04E-04	mg/kg-day	1.00E-01	mg/kg-day	2.0E-03
				Total Xylenes	1.01E+02	mg/kg	1.11E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.29E-03	mg/kg-day	2.00E-01	mg/kg-day	6.5E-03
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	8.12E-07	mg/kg-day	9.30E-03	kg-day/mg	5.3	4.0E-08	9.47E-06	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	8.12E-07	mg/kg-day	3.70E-02	kg-day/mg	N/A	3.0E-08	9.47E-06	mg/kg-day	5.00E-04	mg/kg-day	1.9E-02
			Exp. Route Total									5E-07					2E-01
			Dermal														
				Inorganics													
				Antimony	3.51E-01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	6.00E-05	mg/kg-day	N/A
				Cadmium	2.12E+00	mg/kg	5.51E-09	mg/kg-day	N/A	kg-day/mg	N/A	N/A	6.43E-08	mg/kg-day	2.50E-05	mg/kg-day	2.6E-03
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	4.73E-08	mg/kg-day	2.00E+00	kg-day/mg	N/A	9.5E-08	5.52E-07	mg/kg-day	2.00E-05	mg/kg-day	2.8E-02
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-02	mg/kg-day	N/A
				Ethylbenzene	1.60E+01	mg/kg	N/A	mg/kg-day	1.10E-02	kg-day/mg	N/A	N/A	N/A	mg/kg-day	1.00E-01	mg/kg-day	N/A
				Total Xylenes	1.01E+02	mg/kg	N/A	mg/kg-day	N/A	kg-day/mg	N/A	N/A	N/A	mg/kg-day	2.00E-01	mg/kg-day	N/A
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	N/A	mg/kg-day	9.30E-03	kg-day/mg	5.3	N/A	N/A	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	N/A	mg/kg-day	3.70E-02	kg-day/mg	N/A	N/A	N/A	mg/kg-day	5.00E-04	mg/kg-day	N/A
			Exp. Route Total									9E-08					3E-02
	Fugitive Dust/ Particulates and Volatiles from Subsurface Soil	On-Project Blue Beach Area	Inhalation	**Inorganics**													
				Antimony	3.51E-01	mg/kg	2.12E-08	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	2.47E-07	ug/m^3	3.00E-01	ug/m^3	8.2E-07
				Cadmium	2.12E+00	mg/kg	1.28E-07	ug/m^3	1.80E-03	(ug/m^3)$^{-1}$	N/A	2.3E-10	1.49E-06	ug/m^3	1.00E-02	ug/m^3	1.5E-04
				PCBs													
				Total PCB Aroclors	1.30E-01	mg/kg	3.12E-05	ug/m^3	5.70E-04	(ug/m^3)$^{-1}$	N/A	1.8E-08	3.64E-04	ug/m^3	N/A	ug/m^3	N/A
				VOCs													
				1,2,4-Trimethylbenzene	1.15E+01	mg/kg	1.85E-01	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	2.16E+00	ug/m^3	6.00E+01	ug/m^3	3.6E-02
				Ethylbenzene	1.60E+01	mg/kg	3.60E-01	ug/m^3	2.50E-06	(ug/m^3)$^{-1}$	N/A	9.0E-07	4.20E+00	ug/m^3	1.00E+03	ug/m^3	4.2E-03
				Total Xylenes	1.01E+02	mg/kg	2.25E+00	ug/m^3	N/A	(ug/m^3)$^{-1}$	N/A	N/A	2.62E+01	ug/m^3	1.00E+02	ug/m^3	2.6E-01
				Trichloroethylene (kidney effects)	7.41E-01	mg/kg	4.28E-02	ug/m^3	1.00E-06	(ug/m^3)$^{-1}$	5.3	2.3E-07	5.00E-01	ug/m^3	N/A	ug/m^3	N/A
				Trichloroethylene (NHL+liver effects)	7.41E-01	mg/kg	4.28E-02	ug/m^3	3.10E-06	(ug/m^3)$^{-1}$	N/A	1.3E-07	5.00E-01	ug/m^3	2.00E+00	ug/m^3	2.5E-01
			Exp. Route Total									1E-06					6E-01
Subsurface Soil Total												**2E-06**					**7E-01**

TABLE 3-7.7
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - HYPOTHETICAL FUTURE RESIDENT (CHILD)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Groundwater	Groundwater	On-Project Blue Beach Area	Ingestion	**Inorganics**													
				Antimony	2.22E+00	ug/L	9.49E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.11E-04	mg/kg-day	4.00E-04	mg/kg-day	2.8E-01
				Arsenic	2.94E+00	ug/L	1.26E-05	mg/kg-day	1.50E+00	kg-day/mg	N/A	1.9E-05	1.47E-04	mg/kg-day	3.00E-04	mg/kg-day	4.9E-01
				Barium	1.20E+02	ug/L	5.15E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	6.00E-03	mg/kg-day	2.00E-01	mg/kg-day	3.0E-02
				Cadmium	4.92E+00	ug/L	2.10E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.45E-04	mg/kg-day	5.00E-04	mg/kg-day	4.9E-01
				Chromium	1.07E+02	ug/L	4.59E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	5.35E-03	mg/kg-day	1.50E+00	mg/kg-day	3.6E-03
				Cobalt	4.19E+00	ug/L	1.79E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.09E-04	mg/kg-day	3.00E-04	mg/kg-day	7.0E-01
				Iron	6.03E+04	ug/L	2.58E-01	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.01E+00	mg/kg-day	7.00E-01	mg/kg-day	4.3E+00
				Lead	See Human Health Risk Assessment Report Text												
				Manganese	3.18E+03	ug/L	1.36E-02	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.59E-01	mg/kg-day	2.40E-02	mg/kg-day	6.6E+00
				SVOCs													
				1-Methylnaphthalene	9.00E+01	ug/L	3.85E-04	mg/kg-day	2.90E-02	kg-day/mg	N/A	1.1E-05	4.49E-03	mg/kg-day	7.00E-02	mg/kg-day	6.4E-02
				2-Methylnaphthalene	8.50E+01	ug/L	3.63E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	4.24E-03	mg/kg-day	4.00E-03	mg/kg-day	1.1E+00
				Benzo(a)anthracene	1.38E-01	ug/L	5.90E-07	mg/kg-day	1.00E-01	kg-day/mg	5.3	3.1E-07	6.88E-06	mg/kg-day	N/A	mg/kg-day	N/A
				Benzo(a)Pyrene	1.41E-01	ug/L	6.03E-07	mg/kg-day	1.00E+00	kg-day/mg	5.3	3.2E-06	7.03E-06	mg/kg-day	3.00E-04	mg/kg-day	2.3E-02
				Benzo(b)fluoranthene	2.05E-01	ug/L	8.76E-07	mg/kg-day	1.00E-01	kg-day/mg	5.3	4.6E-07	1.02E-05	mg/kg-day	N/A	mg/kg-day	N/A
				Naphthalene	2.50E+02	ug/L	1.07E-03	mg/kg-day	1.20E-01	kg-day/mg	N/A	1.3E-04	1.25E-02	mg/kg-day	2.00E-02	mg/kg-day	6.2E-01
				VOCs													
				1,1,2,2-Tetrachloroethane	2.00E-01	ug/L	8.55E-07	mg/kg-day	2.00E-01	kg-day/mg	N/A	1.7E-07	9.97E-06	mg/kg-day	2.00E-02	mg/kg-day	5.0E-04
				1,1,2-Trichloroethane	4.00E-01	ug/L	1.71E-06	mg/kg-day	5.70E-02	kg-day/mg	N/A	9.7E-08	1.99E-05	mg/kg-day	4.00E-03	mg/kg-day	5.0E-03
				1,1-Dichloroethane	1.99E-01	ug/L	8.51E-07	mg/kg-day	5.70E-03	kg-day/mg	N/A	4.8E-09	9.92E-06	mg/kg-day	2.00E-01	mg/kg-day	5.0E-05
				1,2,4-Trimethylbenzene	5.84E+01	ug/L	2.50E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.91E-03	mg/kg-day	1.00E-02	mg/kg-day	2.9E-01
				1,2-Dichloropropane	9.40E-01	ug/L	4.02E-06	mg/kg-day	3.70E-02	kg-day/mg	N/A	1.5E-07	4.69E-05	mg/kg-day	4.00E-02	mg/kg-day	1.2E-03
				Chloroform	1.99E-01	ug/L	8.51E-07	mg/kg-day	3.10E-02	kg-day/mg	N/A	2.6E-08	9.92E-06	mg/kg-day	1.00E-02	mg/kg-day	9.9E-04
				cis-1,2-Dichloroethene	7.44E+00	ug/L	3.18E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.71E-04	mg/kg-day	2.00E-03	mg/kg-day	1.9E-01
				Ethylbenzene	8.97E-01	ug/L	3.83E-06	mg/kg-day	1.10E-02	kg-day/mg	N/A	4.2E-08	4.47E-05	mg/kg-day	1.00E-01	mg/kg-day	4.5E-04
				Tetrachloroethene	1.04E+00	ug/L	4.45E-06	mg/kg-day	2.10E-03	kg-day/mg	N/A	9.3E-09	5.19E-05	mg/kg-day	6.00E-03	mg/kg-day	8.7E-03
				Total Xylenes	8.99E+00	ug/L	3.84E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	4.48E-04	mg/kg-day	2.00E-01	mg/kg-day	2.2E-03
				Trichloroethylene (kidney effects)	3.25E+01	ug/L	1.39E-04	mg/kg-day	9.30E-03	kg-day/mg	5.3	6.8E-06	1.62E-03	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	3.25E+01	ug/L	1.39E-04	mg/kg-day	3.70E-02	kg-day/mg	N/A	5.1E-06	1.62E-03	mg/kg-day	5.00E-04	mg/kg-day	3.2E+00
				Vinyl Chloride	2.00E+00	ug/L	8.55E-06	mg/kg-day	1.40E+00	kg-day/mg	N/A	1.2E-05	9.97E-05	mg/kg-day	3.00E-03	mg/kg-day	3.3E-02
			Exp. Route Total									2E-04					2E+01

TABLE 3-7.7
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - HYPOTHETICAL FUTURE RESIDENT (CHILD)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF [1]	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Groundwater	Groundwater	On-Project Blue Beach Area	Dermal	**Inorganics**													
				Antimony	2.22E+00	ug/L	4.18E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	4.88E-07	mg/kg-day	6.00E-05	mg/kg-day	8.1E-03
				Arsenic	2.94E+00	ug/L	5.54E-08	mg/kg-day	1.50E+00	kg-day/mg	N/A	8.3E-08	6.47E-07	mg/kg-day	3.00E-04	mg/kg-day	2.2E-03
				Barium	1.20E+02	ug/L	2.27E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.65E-05	mg/kg-day	1.40E-02	mg/kg-day	1.9E-03
				Cadmium	4.92E+00	ug/L	9.26E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.08E-06	mg/kg-day	2.50E-05	mg/kg-day	4.3E-02
				Chromium	1.07E+02	ug/L	2.02E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.36E-05	mg/kg-day	1.95E-02	mg/kg-day	1.2E-03
				Cobalt	4.19E+00	ug/L	3.16E-08	mg/kg-day	N/A	kg-day/mg	N/A	N/A	3.69E-07	mg/kg-day	3.00E-04	mg/kg-day	1.2E-03
				Iron	6.03E+04	ug/L	1.14E-03	mg/kg-day	N/A	kg-day/mg	N/A	N/A	1.33E-02	mg/kg-day	7.00E-01	mg/kg-day	1.9E-02
				Lead	See Human Health Risk Assessment Report Text												
				Manganese	3.18E+03	ug/L	5.99E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	6.99E-04	mg/kg-day	9.60E-04	mg/kg-day	7.3E-01
				SVOCs													
				1-Methylnaphthalene	9.00E+01	ug/L	4.85E-04	mg/kg-day	2.90E-02	kg-day/mg	N/A	1.4E-05	5.66E-03	mg/kg-day	7.00E-02	mg/kg-day	8.1E-02
				2-Methylnaphthalene	8.50E+01	ug/L	4.51E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	5.26E-03	mg/kg-day	4.00E-03	mg/kg-day	1.3E+00
				Benzo(a)anthracene	1.38E-01	ug/L	N/A	mg/kg-day	1.00E-01	kg-day/mg	5.3	N/A	N/A	mg/kg-day	N/A	mg/kg-day	N/A
				Benzo(a)Pyrene	1.41E-01	ug/L	N/A	mg/kg-day	1.00E+00	kg-day/mg	5.3	N/A	N/A	mg/kg-day	3.00E-04	mg/kg-day	N/A
				Benzo(b)fluoranthene	2.05E-01	ug/L	N/A	mg/kg-day	1.00E-01	kg-day/mg	5.3	N/A	N/A	mg/kg-day	N/A	mg/kg-day	N/A
				Naphthalene	2.50E+02	ug/L	6.17E-04	mg/kg-day	1.20E-01	kg-day/mg	N/A	7.4E-05	7.19E-03	mg/kg-day	2.00E-02	mg/kg-day	3.6E-01
				VOCs													
				1,1,2,2-Tetrachloroethane	2.00E-01	ug/L	9.48E-08	mg/kg-day	2.00E-01	kg-day/mg	N/A	1.9E-08	1.11E-06	mg/kg-day	2.00E-02	mg/kg-day	5.5E-05
				1,1,2-Trichloroethane	4.00E-01	ug/L	1.41E-07	mg/kg-day	5.70E-02	kg-day/mg	N/A	8.0E-09	1.64E-06	mg/kg-day	4.00E-03	mg/kg-day	4.1E-04
				1,1-Dichloroethane	1.99E-01	ug/L	5.88E-08	mg/kg-day	5.70E-03	kg-day/mg	N/A	3.4E-10	6.86E-07	mg/kg-day	2.00E-01	mg/kg-day	3.4E-06
				1,2,4-Trimethylbenzene	5.84E+01	ug/L	2.51E-04	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.93E-03	mg/kg-day	1.00E-02	mg/kg-day	2.9E-01
				1,2-Dichloropropane	9.40E-01	ug/L	3.50E-07	mg/kg-day	3.70E-02	kg-day/mg	N/A	1.3E-08	4.08E-06	mg/kg-day	4.00E-02	mg/kg-day	1.0E-04
				Chloroform	1.99E-01	ug/L	6.79E-08	mg/kg-day	3.10E-02	kg-day/mg	N/A	2.1E-09	7.92E-07	mg/kg-day	1.00E-02	mg/kg-day	7.9E-05
				cis-1,2-Dichloroethene	7.44E+00	ug/L	3.54E-06	mg/kg-day	N/A	kg-day/mg	N/A	N/A	4.13E-05	mg/kg-day	2.00E-03	mg/kg-day	2.1E-02
				Ethylbenzene	8.97E-01	ug/L	2.03E-06	mg/kg-day	1.10E-02	kg-day/mg	N/A	2.2E-08	2.37E-05	mg/kg-day	1.00E-01	mg/kg-day	2.4E-04
				Tetrachloroethene	1.04E+00	ug/L	2.35E-06	mg/kg-day	2.10E-03	kg-day/mg	N/A	4.9E-09	2.74E-05	mg/kg-day	6.00E-03	mg/kg-day	4.6E-03
				Total Xylenes	8.99E+00	ug/L	2.06E-05	mg/kg-day	N/A	kg-day/mg	N/A	N/A	2.41E-04	mg/kg-day	2.00E-01	mg/kg-day	1.2E-03
				Trichloroethylene (kidney effects)	3.25E+01	ug/L	2.04E-05	mg/kg-day	9.30E-03	kg-day/mg	5.3	1.0E-06	2.38E-04	mg/kg-day	N/A	mg/kg-day	N/A
				Trichloroethylene (NHL+liver effects)	3.25E+01	ug/L	2.04E-05	mg/kg-day	3.70E-02	kg-day/mg	N/A	7.6E-07	2.38E-04	mg/kg-day	5.00E-04	mg/kg-day	4.8E-01
				Vinyl Chloride	2.00E+00	ug/L	3.87E-07	mg/kg-day	1.40E+00	kg-day/mg	N/A	5.4E-07	4.52E-06	mg/kg-day	3.00E-03	mg/kg-day	1.5E-03
			Exp. Route Total									9E-05					3E+00

TABLE 3-7.7
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - HYPOTHETICAL FUTURE RESIDENT (CHILD)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

							Cancer Risk Calculations						Noncancer Hazard Calculations				
					EPC		Intake/Exposure Concentration		CSF or IUR				Intake/Exposure Concentration		RfD or RfC		
Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	Value	Units	Value	Units	Value	Units	ADAF (1)	Cancer Risk	Value	Units	Value	Units	Hazard Quotient
Groundwater	Shower Air	On-Project Blue Beach Area	Inhalation	**SVOCs**													
				1-Methylnaphthalene	8.40E+02	ug/m^3	1.98E+00	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	2.32E+01	ug/m^3	N/A	ug/m^3	N/A
				2-Methylnaphthalene	7.95E+02	ug/m^3	1.88E+00	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	2.19E+01	ug/m^3	N/A	ug/m^3	N/A
				Benzo(a)anthracene	8.07E-02	ug/m^3	1.91E-04	ug/m^3	6.00E-05	$(ug/m^3)^{-1}$	5.3	6E-08	2.22E-03	ug/m^3	N/A	ug/m^3	N/A
				Naphthalene	2.33E+03	ug/m^3	5.51E+00	ug/m^3	3.40E-05	$(ug/m^3)^{-1}$	N/A	2E-04	6.42E+01	ug/m^3	3.00E+00	ug/m^3	2E+01
				VOCs													
				1,1,2,2-Tetrachloroethane	1.56E+00	ug/m^3	3.70E-03	ug/m^3	5.80E-05	$(ug/m^3)^{-1}$	N/A	2E-07	4.31E-02	ug/m^3	N/A	ug/m^3	N/A
				1,1,2-Trichloroethane	4.27E+00	ug/m^3	1.01E-02	ug/m^3	1.60E-05	$(ug/m^3)^{-1}$	N/A	2E-07	1.18E-01	ug/m^3	2.00E-01	ug/m^3	6E-01
				1,1-Dichloroethane	2.84E+00	ug/m^3	6.71E-03	ug/m^3	1.60E-06	$(ug/m^3)^{-1}$	N/A	1E-08	7.83E-02	ug/m^3	N/A	ug/m^3	N/A
				1,2,4-Trimethylbenzene	7.77E+02	ug/m^3	1.84E+00	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	2.14E+01	ug/m^3	6.00E+01	ug/m^3	4E-01
				1,2-Dichloropropane	1.24E+01	ug/m^3	2.92E-02	ug/m^3	3.70E-06	$(ug/m^3)^{-1}$	N/A	1E-07	3.41E-01	ug/m^3	4.00E+00	ug/m^3	9E-02
				Chloroform	2.60E+00	ug/m^3	6.15E-03	ug/m^3	2.30E-05	$(ug/m^3)^{-1}$	N/A	1E-07	7.17E-02	ug/m^3	9.80E+01	ug/m^3	7E-04
				cis-1,2-Dichloroethene	1.06E+02	ug/m^3	2.50E-01	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	2.91E+00	ug/m^3	N/A	ug/m^3	N/A
				Ethylbenzene	1.26E+01	ug/m^3	2.97E-02	ug/m^3	2.50E-06	$(ug/m^3)^{-1}$	N/A	7E-08	3.47E-01	ug/m^3	1.00E+03	ug/m^3	3E-04
				Tetrachloroethene	1.25E+01	ug/m^3	2.95E-02	ug/m^3	2.60E-07	$(ug/m^3)^{-1}$	N/A	8E-09	3.44E-01	ug/m^3	4.00E+01	ug/m^3	9E-03
				Total Xylenes	1.26E+02	ug/m^3	2.97E-01	ug/m^3	N/A	$(ug/m^3)^{-1}$	N/A	N/A	3.46E+00	ug/m^3	1.00E+02	ug/m^3	3E-02
				Trichloroethylene (kidney effects)	4.22E+02	ug/m^3	9.98E-01	ug/m^3	1.00E-06	$(ug/m^3)^{-1}$	5.3	5E-06	1.16E+01	ug/m^3	N/A	ug/m^3	N/A
				Trichloroethylene (NHL+liver effects)	4.22E+02	ug/m^3	9.98E-01	ug/m^3	3.10E-06	$(ug/m^3)^{-1}$	N/A	3E-06	1.16E+01	ug/m^3	2.00E+00	ug/m^3	6E+00
				Vinyl Chloride	3.44E+01	ug/m^3	8.13E-02	ug/m^3	8.80E-06	$(ug/m^3)^{-1}$	N/A	7E-07	9.48E-01	ug/m^3	1.00E+02	ug/m^3	9E-03
			Exp. Route Total									2E-04					3E+01
Groundwater Total												**5E-04**					**5E+01**
Total Receptor Risk/Hazard												(2)					(2)

Notes:
ADAF = Age-dependent adjustment factor.
CSF = Cancer slope factor.
EPC = Exposure point concentration.
IUR = Inhalation unit risk factor.
N/A = Not applicable.
NHL = Non-Hodgkin's lymphoma.
PCBs = Polychlorinated biphenyls.
RfC = Inhalation reference concentration.
RfD = Oral reference dose.
RME = Reasonable Maximum Exposure.
SVOCs = Semivolatile organic compounds.
VOCs = Volatile organic compounds.
(1) ADAF is used for chemicals with a mutagenic mode of action for carcinogenesis. The cancer risk is adjusted by multiplying the calculated risk by the ADAF.
A combined, age-weighted ADAF of 5.3 [$ADAF_{0-<2\ years}$ (10) × (2 years/6 years) + $ADAF_{2-<6\ years}$ (3) × (4 years/6 years)] is used.
The CSF/IUR for vinyl chloride account for mutagenic effects, therefore, application of the ADAFs is not necessary for evaluation of mutagenic mode of action.
(2) Presented on corresponding summary of risk/hazard table.

TABLE 3-9.1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER (ON-PROJECT BLUE BEACH AREA SURFACE SOIL AND SHALLOW GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Mortality, Blood	4E-04	N/A	N/A	4E-04
			Cadmium	N/A	N/A	N/A	N/A	Kidney	1E-03	N/A	1E-04	1E-03
			PCBs									
			Total PCB Aroclors	4E-09	N/A	2E-09	6E-09	Nervous	5E-03	N/A	2E-03	7E-03
			SVOCs									
			Dibenzo(a,h)Anthracene	2E-10	N/A	8E-11	3E-10	N/A	N/A	N/A	N/A	N/A
			Chemical Total	4E-09	N/A	2E-09	6E-09		6E-03	N/A	2E-03	8E-03
	Fugitive Dust/ Particulates and Volatiles from Surface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Respiratory	N/A	2E-05	N/A	2E-05
			Cadmium	N/A	3E-09	N/A	3E-09	Kidney	N/A	1E-02	N/A	1E-02
			PCBs									
			Total PCB Aroclors	N/A	2E-09	N/A	2E-09	N/A	N/A	N/A	N/A	N/A
			SVOCs									
			Dibenzo(a,h)Anthracene	N/A	2E-11	N/A	2E-11	N/A	N/A	N/A	N/A	N/A
			Chemical Total	N/A	5E-09	N/A	5E-09		N/A	1E-02	N/A	1E-02
		Exposure Point Total					**1E-08**					**2E-02**

TABLE 3-9.1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER (ON-PROJECT BLUE BEACH AREA SURFACE SOIL AND SHALLOW GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Mortality, Blood	4E-05	N/A	2E-03	2E-03
			Arsenic	6E-10	N/A	4E-09	5E-09	Skin, Vascular	9E-05	N/A	7E-04	7E-04
			Cadmium	N/A	N/A	N/A	N/A	Musculoskeletal	3E-04	N/A	4E-02	4E-02
			Cobalt	N/A	N/A	N/A	N/A	Thyroid	1E-05	N/A	3E-05	4E-05
			Iron	N/A	N/A	N/A	N/A	Gastrointestinal	6E-04	N/A	4E-03	5E-03
			Manganese	N/A	N/A	N/A	N/A	Nervous	9E-04	N/A	2E-01	2E-01
			SVOCs									
			1-Methylnaphthalene	3E-10	N/A	1E-07	1E-07	Respiratory	9E-06	N/A	5E-03	5E-03
			2-Methylnaphthalene	N/A	N/A	N/A	N/A	Respiratory	1E-04	N/A	8E-02	8E-02
			Benzo(a)anthracene	1E-12	N/A	N/A	1E-12	N/A	N/A	N/A	N/A	N/A
			Benzo(a)Pyrene	1E-11	N/A	N/A	1E-11	Developmental	3E-06	N/A	N/A	3E-06
			Benzo(b)fluoranthene	2E-12	N/A	N/A	2E-12	N/A	N/A	N/A	N/A	N/A
			Naphthalene	3E-09	N/A	9E-07	9E-07	Nervous	3E-06	N/A	9E-04	9E-04
			VOCs									
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	5E-05	N/A	3E-02	3E-02
			1,2-Dichloropropane	3E-12	N/A	2E-10	2E-10	Musculoskeletal	2E-07	N/A	9E-06	1E-05
			cis-1,2-Dichloroethene	N/A	N/A	N/A	N/A	Kidney	8E-07	N/A	6E-05	6E-05
			Ethylbenzene	5E-12	N/A	2E-09	2E-09	Liver	7E-07	N/A	2E-04	2E-04
			Total Xylenes	N/A	N/A	N/A	N/A	Decreased body weight	7E-07	N/A	2E-04	2E-04
			Trichloroethylene (kidney effects)	2E-11	N/A	2E-09	2E-09	NA	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	9E-11	N/A	8E-09	8E-09	Developmental, Immune	3E-04	N/A	3E-02	3E-02
			Chemical Total	4E-09	N/A	1E-06	1E-06		2E-03	N/A	4E-01	4E-01

TABLE 3-9.1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER (ON-PROJECT BLUE BEACH AREA SURFACE SOIL AND SHALLOW GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Trench Air	On-Project Blue Beach Area	**SVOCs**									
			1-Methylnaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			2-Methylnaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Benzo(a)anthracene	N/A	2E-11	N/A	2E-11	N/A	N/A	N/A	N/A	N/A
			Naphthalene	N/A	9E-08	N/A	9E-08	Nervous, Respiratory	N/A	6E-02	N/A	6E-02
			VOCs									
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	N/A	1E-03	N/A	1E-03
			1,2-Dichloropropane	N/A	4E-11	N/A	4E-11	Respiratory	N/A	2E-04	N/A	2E-04
			cis-1,2-Dichloroethene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Ethylbenzene	N/A	1E-10	N/A	1E-10	Ear	N/A	4E-07	N/A	4E-07
			Total Xylenes	N/A	N/A	N/A	N/A	Nervous	N/A	8E-05	N/A	8E-05
			Trichloroethylene (kidney effects)	N/A	3E-10	N/A	3E-10	N/A	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	N/A	1E-09	N/A	1E-09	Developmental, Immune	N/A	1E-02	N/A	1E-02
			Chemical Total	N/A	9E-08	N/A	9E-08		N/A	7E-02	N/A	7E-02
		Exposure Point Total					**1E-06**					**4E-01**
						Total of Receptor Risks:	**1E-06**				**Total of Receptor HI*:**	**5E-01**

Notes:

***Endpoint-specific HIs are not calculated since combined endpoint HI is < 1.**

< = less than.

COPC = Chemical of potential concern.

HI = Hazard index.

HQ = Hazard quotient.

N/A = Not applicable.

NHL = Non-Hodgkin's lymphoma.

PCBs = Polychlorinated biphenyls.

RME = Reasonable Maximum Exposure.

SVOCs = Semivolatile organic compounds.

VOCs = Volatile organic compounds.

Totals are calculated based on unrounded chemical-specific values.

TABLE 3-9.2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER (ON-PROJECT BLUE BEACH AREA SUBSURFACE SOIL AND SHALLOW GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Subsurface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Mortality, Blood	4E-04	N/A	N/A	4E-04
			Cadmium	N/A	N/A	N/A	N/A	Kidney	1E-03	N/A	1E-04	1E-03
			PCBs									
			Total PCB Aroclors	2E-09	N/A	8E-10	2E-09	Nervous	2E-03	N/A	9E-04	3E-03
			VOCs									
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	1E-04	N/A	N/A	1E-04
			Ethylbenzene	1E-09	N/A	N/A	1E-09	Liver	1E-04	N/A	N/A	1E-04
			Total Xylenes	N/A	N/A	N/A	N/A	Decreased body weight	1E-04	N/A	N/A	1E-04
			Trichloroethylene (kidney effects)	4E-11	N/A	N/A	4E-11	N/A	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	2E-10	N/A	N/A	2E-10	Developmental, Immune	7E-04	N/A	N/A	7E-04
			Chemical Total	3E-09	N/A	8E-10	4E-09		4E-03	N/A	1E-03	5E-03
	Fugitive Dust/ Particulates and Volatiles from Subsurface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Respiratory	N/A	2E-05	N/A	2E-05
			Cadmium	N/A	3E-09	N/A	3E-09	Kidney	N/A	1E-02	N/A	1E-02
			PCBs									
			Total PCB Aroclors	N/A	8E-10	N/A	8E-10	N/A	N/A	N/A	N/A	N/A
			VOCs									
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	N/A	3E-03	N/A	3E-03
			Ethylbenzene	N/A	4E-08	N/A	4E-08	Ear	N/A	1E-04	N/A	1E-04
			Total Xylenes	N/A	N/A	N/A	N/A	Nervous	N/A	2E-02	N/A	2E-02
			Trichloroethylene (kidney effects)	N/A	2E-09	N/A	2E-09	N/A	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	N/A	5E-09	N/A	5E-09	Developmental, Immune	N/A	5E-02	N/A	5E-02
			Chemical Total	N/A	5E-08	N/A	5E-08		N/A	9E-02	N/A	9E-02
		Exposure Point Total					**5E-08**					**9E-02**

TABLE 3-9.2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER (ON-PROJECT BLUE BEACH AREA SUBSURFACE SOIL AND SHALLOW GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Mortality, Blood	4E-05	N/A	2E-03	2E-03
			Arsenic	6E-10	N/A	4E-09	5E-09	Skin, Vascular	9E-05	N/A	7E-04	7E-04
			Cadmium	N/A	N/A	N/A	N/A	Musculoskeletal	3E-04	N/A	4E-02	4E-02
			Cobalt	N/A	N/A	N/A	N/A	Thyroid	1E-05	N/A	3E-05	4E-05
			Iron	N/A	N/A	N/A	N/A	Gastrointestinal	6E-04	N/A	4E-03	5E-03
			Manganese	N/A	N/A	N/A	N/A	Nervous	9E-04	N/A	2E-01	2E-01
			SVOCs									
			1-Methylnaphthalene	3E-10	N/A	1E-07	1E-07	Respiratory	9E-06	N/A	5E-03	5E-03
			2-Methylnaphthalene	N/A	N/A	N/A	N/A	Respiratory	1E-04	N/A	8E-02	8E-02
			Benzo(a)anthracene	1E-12	N/A	N/A	1E-12	N/A	N/A	N/A	N/A	N/A
			Benzo(a)Pyrene	1E-11	N/A	N/A	1E-11	Developmental	3E-06	N/A	N/A	3E-06
			Benzo(b)fluoranthene	2E-12	N/A	N/A	2E-12	N/A	N/A	N/A	N/A	N/A
			Naphthalene	3E-09	N/A	9E-07	9E-07	Nervous	3E-06	N/A	9E-04	9E-04
			VOCs									
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	5E-05	N/A	3E-02	3E-02
			1,2-Dichloropropane	3E-12	N/A	2E-10	2E-10	Musculoskeletal	2E-07	N/A	9E-06	1E-05
			cis-1,2-Dichloroethene	N/A	N/A	N/A	N/A	Kidney	8E-07	N/A	6E-05	6E-05
			Ethylbenzene	5E-12	N/A	2E-09	2E-09	Liver	7E-07	N/A	2E-04	2E-04
			Total Xylenes	N/A	N/A	N/A	N/A	Decreased body weight	7E-07	N/A	2E-04	2E-04
			Trichloroethylene (kidney effects)	2E-11	N/A	2E-09	2E-09	NA	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	9E-11	N/A	8E-09	8E-09	Developmental, Immune	3E-04	N/A	3E-02	3E-02
			Chemical Total	4E-09	N/A	1E-06	1E-06		2E-03	N/A	4E-01	4E-01

TABLE 3-9.2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKER (ON-PROJECT BLUE BEACH AREA SUBSURFACE SOIL AND SHALLOW GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Construction/Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Trench Air	On-Project Blue Beach Area	**SVOCs**									
			1-Methylnaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			2-Methylnaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Benzo(a)anthracene	N/A	2E-11	N/A	2E-11	N/A	N/A	N/A	N/A	N/A
			Naphthalene	N/A	9E-08	N/A	9E-08	Nervous, Respiratory	N/A	6E-02	N/A	6E-02
			VOCs									
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	N/A	1E-03	N/A	1E-03
			1,2-Dichloropropane	N/A	4E-11	N/A	4E-11	Respiratory	N/A	2E-04	N/A	2E-04
			cis-1,2-Dichloroethene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Ethylbenzene	N/A	1E-10	N/A	1E-10	Ear	N/A	4E-07	N/A	4E-07
			Total Xylenes	N/A	N/A	N/A	N/A	Nervous	N/A	8E-05	N/A	8E-05
			Trichloroethylene (kidney effects)	N/A	3E-10	N/A	3E-10	N/A	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	N/A	1E-09	N/A	1E-09	Developmental, Immune	N/A	1E-02	N/A	1E-02
			Chemical Total	N/A	9E-08	N/A	9E-08		N/A	7E-02	N/A	7E-02
		Exposure Point Total					**1E-06**					**4E-01**
						Total of Receptor Risks:	**1E-06**				**Total of Receptor HI*:**	**5E-01**

Notes:

***Endpoint-specific HIs are not calculated since combined endpoint HI is < 1.**

< = less than.

COPC = Chemical of potential concern.

HI = Hazard index.

HQ = Hazard quotient.

N/A = Not applicable.

NHL = Non-Hodgkin's lymphoma.

PCBs = Polychlorinated biphenyls.

RME = Reasonable Maximum Exposure.

SVOCs = Semivolatile organic compounds.

VOCs = Volatile organic compounds.

Totals are calculated based on unrounded chemical-specific values.

TABLE 3-9.3

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - OUTDOOR WORKER (ON-PROJECT BLUE BEACH AREA SURFACE SOIL)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Outdoor Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Mortality, Blood	8E-04	N/A	N/A	8E-04
			Cadmium	N/A	N/A	N/A	N/A	Kidney	2E-03	N/A	3E-04	2E-03
			PCBs									
			Total PCB Aroclors	2E-07	N/A	1E-07	3E-07	Eye, Nails, Immune	1E-02	N/A	8E-03	2E-02
			SVOCs									
			Dibenzo(a,h)Anthracene	9E-09	N/A	5E-09	1E-08	N/A	N/A	N/A	N/A	N/A
			Chemical Total	2E-07	N/A	1E-07	3E-07		2E-02	N/A	8E-03	2E-02
	Fugitive Dust/ Particulates and Volatiles from Surface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Respiratory	N/A	2E-07	N/A	2E-07
			Cadmium	N/A	2E-10	N/A	2E-10	Kidney	N/A	4E-05	N/A	4E-05
			PCBs									
			Total PCB Aroclors	N/A	4E-08	N/A	4E-08	N/A	N/A	N/A	N/A	N/A
			SVOCs									
			Dibenzo(a,h)Anthracene	N/A	1E-12	N/A	1E-12	N/A	N/A	N/A	N/A	N/A
			Chemical Total	N/A	4E-08	N/A	4E-08		N/A	4E-05	N/A	4E-05
		Exposure Point Total					**4E-07**					**2E-02**
						Total of Receptor Risks:	**4E-07**				**Total of Receptor HI*:**	**2E-02**

Notes:

***Endpoint-specific HIs are not calculated since combined endpoint HI is < 1.**

< = less than.

COPC = Chemical of potential concern.

HI = Hazard index.

N/A = Not applicable.

PCBs = Polychlorinated biphenyls.

RME = Reasonable Maximum Exposure.

SVOCs = Semivolatile organic compounds.

Totals are calculated based on unrounded chemical-specific values.

TABLE 3-9.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - OUTDOOR WORKER (ON-PROJECT BLUE BEACH AREA SUBSURFACE SOIL)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Outdoor Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Subsurface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Mortality, Blood	8E-04	N/A	N/A	8E-04
			Cadmium	N/A	N/A	N/A	N/A	Kidney	2E-03	N/A	3E-04	2E-03
			PCBs									
			Total PCB Aroclors	8E-08	N/A	5E-08	1E-07	Eye, Nails, Immune	6E-03	N/A	3E-03	9E-03
			VOCs									
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	1E-03	N/A	N/A	1E-03
			Ethylbenzene	5E-08	N/A	N/A	5E-08	Liver, Kidney	1E-04	N/A	N/A	1E-04
			Total Xylenes	N/A	N/A	N/A	N/A	Decreased body weight, Increased mortality	4E-04	N/A	N/A	4E-04
			Trichloroethylene (kidney effects)	2E-09	N/A	N/A	2E-09	N/A	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	8E-09	N/A	N/A	8E-09	Developmental, Immune	1E-03	N/A	N/A	1E-03
			Chemical Total	1E-07	N/A	5E-08	2E-07		1E-02	N/A	4E-03	1E-02
Soil	Fugitive Dust/ Particulates and Volatiles from Subsurface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Respiratory	N/A	2E-07	N/A	2E-07
			Cadmium	N/A	2E-10	N/A	2E-10	Kidney	N/A	4E-05	N/A	4E-05
			PCBs									
			Total PCB Aroclors	N/A	2E-08	N/A	2E-08	N/A	N/A	N/A	N/A	N/A
			VOCs									
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	N/A	9E-03	N/A	9E-03
			Ethylbenzene	N/A	9E-07	N/A	9E-07	Developmental	N/A	1E-03	N/A	1E-03
			Total Xylenes	N/A	N/A	N/A	N/A	Nervous	N/A	6E-02	N/A	6E-02
			Trichloroethylene (kidney effects)	N/A	4E-08	N/A	4E-08	N/A	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	N/A	1E-07	N/A	1E-07	Developmental, Immune	N/A	6E-02	N/A	6E-02
			Chemical Total	N/A	1E-06	N/A	1E-06		N/A	1E-01	N/A	1E-01
		Exposure Point Total					**1E-06**					**1E-01**
						Total of Receptor Risks:	**1E-06**				**Total of Receptor HI*:**	**1E-01**

Notes:

***Endpoint-specific HIs are not calculated since combined endpoint HI is < 1.**

< = less than.

COPC = Chemical of potential concern.

HI = Hazard index.

N/A = Not applicable.

NHL = Non-Hodgkin's lymphoma.

PCBs = Polychlorinated biphenyls.

RME = Reasonable Maximum Exposure.

VOCs = Volatile organic compounds.

Totals are calculated based on unrounded chemical-specific values.

TABLE 3-9.5

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TRESPASSER (ON-PROJECT BLUE BEACH AREA SURFACE SOIL)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent (ages 7-<16)

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Mortality, Blood	2E-04	N/A	N/A	2E-04
			Cadmium	N/A	N/A	N/A	N/A	Kidney	4E-04	N/A	4E-05	4E-04
			PCBs									
			Total PCB Aroclors	1E-08	N/A	5E-09	2E-08	Eye, Nails, Immune	3E-03	N/A	9E-04	3E-03
			SVOCs									
			Dibenzo(a,h)Anthracene	2E-09	N/A	6E-10	3E-09	N/A	N/A	N/A	N/A	N/A
			Chemical Total	1E-08	N/A	5E-09	2E-08		3E-03	N/A	9E-04	4E-03
	Fugitive Dust/ Particulates and Volatiles from Surface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Respiratory	N/A	6E-09	N/A	6E-09
			Cadmium	N/A	2E-12	N/A	2E-12	Kidney	N/A	9E-07	N/A	9E-07
			PCBs									
			Total PCB Aroclors	N/A	7E-10	N/A	7E-10	N/A	N/A	N/A	N/A	N/A
			SVOCs									
			Dibenzo(a,h)Anthracene	N/A	3E-14	N/A	3E-14	N/A	N/A	N/A	N/A	N/A
			Chemical Total	N/A	7E-10	N/A	7E-10		N/A	1E-06	N/A	1E-06
		Exposure Point Total					**2E-08**					**4E-03**
						Total of Receptor Risks:	**2E-08**				**Total of Receptor HI*:**	**4E-03**

Notes:

***Endpoint-specific HIs are not calculated since combined endpoint HI is < 1.**

< = less than.

COPC = Chemical of potential concern.

HI = Hazard index.

N/A = Not applicable.

NHL = Non-Hodgkin's lymphoma.

PCBs = Polychlorinated biphenyls.

RME = Reasonable Maximum Exposure.

SVOCs = Semivolatile organic compounds.

Totals are calculated based on unrounded chemical-specific values.

TABLE 3-9.6
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TRESPASSER (ON-PROJECT BLUE BEACH AREA SUBSURFACE SOIL)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Trespasser
Receptor Age: Adolescent (ages 7-<16)

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Subsurface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Mortality, Blood	1E-04	N/A	N/A	1E-04
			Cadmium	N/A	N/A	N/A	N/A	Kidney	3E-04	N/A	3E-05	4E-04
			PCBs									
			Total PCB Aroclors	5E-09	N/A	2E-09	7E-09	Eye, Nails, Immune	1E-03	N/A	4E-04	1E-03
			VOCs									
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	2E-04	N/A	N/A	2E-04
			Ethylbenzene	4E-09	N/A	N/A	4E-09	Liver, Kidney	3E-05	N/A	N/A	3E-05
			Total Xylenes	N/A	N/A	N/A	N/A	Decreased body weight, Increased mortality	8E-05	N/A	N/A	8E-05
			Trichloroethylene (kidney effects)	4E-10	N/A	N/A	4E-10	N/A	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	6E-10	N/A	N/A	6E-10	Developmental, Immune	2E-04	N/A	N/A	2E-04
			Chemical Total	1E-08	N/A	2E-09	1E-08		2E-03	N/A	4E-04	2E-03
Soil	Fugitive Dust/ Particulates and Volatiles from Subsurface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Respiratory	N/A	5E-09	N/A	5E-09
			Cadmium	N/A	2E-12	N/A	2E-12	Kidney	N/A	9E-07	N/A	9E-07
			PCBs									
			Total PCB Aroclors	N/A	3E-10	N/A	3E-10	N/A	N/A	N/A	N/A	N/A
			VOCs									
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	N/A	4E-04	N/A	4E-04
			Ethylbenzene	N/A	1E-08	N/A	1E-08	Developmental	N/A	4E-05	N/A	4E-05
			Total Xylenes	N/A	N/A	N/A	N/A	Nervous	N/A	3E-03	N/A	3E-03
			Trichloroethylene (kidney effects)	N/A	2E-09	N/A	2E-09	N/A	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	N/A	2E-09	N/A	2E-09	Developmental, Immune	N/A	3E-03	N/A	3E-03
			Chemical Total	N/A	2E-08	N/A	2E-08		N/A	6E-03	N/A	6E-03
		Exposure Point Total					**3E-08**					**8E-03**
						Total of Receptor Risks:	**3E-08**				**Total of Receptor HI*:**	**8E-03**

Notes:

***Endpoint-specific HIs are not calculated since combined endpoint HI is < 1.**

< = less than.

COPC = Chemical of potential concern.

HI = Hazard index.

N/A = Not applicable.

NHL = Non-Hodgkin's lymphoma.

PCBs = Polychlorinated biphenyls.

RME = Reasonable Maximum Exposure.

VOCs = Volatile organic compounds.

Totals are calculated based on unrounded chemical-specific values.

TABLE 3-9.7

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RECREATIONAL USER (OFF-PROJECT RED MAPLE SWAMP/TIDAL STREAM AREA SURFACE SOIL, HYDRIC SURFACE SOIL, SEDIMENT, AND SURFACE WATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Receptor Population: Recreational User
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Off-Project Red	**PCBs**									
		Maple Swamp/	Total PCB Aroclors	5E-08	N/A	2E-08	7E-08	Eye, Nails, Immune	1E-02	N/A	4E-03	2E-02
		Tidal Stream Area	Chemical Total	5E-08	N/A	2E-08	7E-08		1E-02	N/A	4E-03	2E-02
	Fugitive Dust/	Off-Project Red	**PCBs**									
	Particulates	Maple Swamp/	Total PCB Aroclors	N/A	3E-10	N/A	3E-10	N/A	N/A	N/A	N/A	N/A
	and Volatiles	Tidal Stream Area	Chemical Total	N/A	3E-10	N/A	3E-10		N/A	N/A	N/A	N/A
	from Surface Soil	**Exposure Point Total**					**7E-08**					**2E-02**
Hydric Soil	Hydric Surface	Off-Project Red	**Inorganics**									
	Soil	Maple Swamp/	Arsenic	1E-07	N/A	1E-07	2E-07	Skin, Vascular	2E-03	N/A	2E-03	4E-03
		Tidal Stream Area	Thallium	N/A	N/A	N/A	N/A	Hair, Skin	2E-03	N/A	N/A	2E-03
			PCBs									
			Total PCB Aroclors	2E-08	N/A	8E-08	1E-07	Eye, Nails, Immune	5E-03	N/A	2E-02	2E-02
			SVOCs									
			Benzo(a)Pyrene	8E-08	N/A	3E-07	4E-07	Developmental	6E-04	N/A	2E-03	2E-03
			Benzo(b)fluoranthene	1E-08	N/A	3E-08	5E-08	N/A	N/A	N/A	N/A	N/A
			Dibenzo(a,h)Anthracene	2E-08	N/A	5E-08	7E-08	N/A	N/A	N/A	N/A	N/A
			Indeno(1,2,3-CD)Pyrene	1E-08	N/A	4E-08	5E-08	N/A	N/A	N/A	N/A	N/A
			Chemical Total	2E-07	N/A	6E-07	9E-07		9E-03	N/A	2E-02	3E-02
		Exposure Point Total					**9E-07**					**3E-02**
Sediment	Sediment	Off-Project Red	**PCBs**									
		Maple Swamp/	Total PCB Aroclors	9E-09	N/A	4E-08	5E-08	Eye, Nails, Immune	2E-03	N/A	7E-03	9E-03
		Tidal Stream Area	Chemical Total	9E-09	N/A	4E-08	5E-08		2E-03	N/A	7E-03	9E-03
		Exposure Point Total					**5E-08**					**9E-03**
Surface Water	Surface Water	Off-Project Red	**VOCs**									
		Maple Swamp/	1,2,3-Trichlorobenzene	N/A	N/A	N/A	N/A	Liver, Thyroid, Reduced body weight	N/A	N/A	4E-04	4E-04
		Tidal Stream Area	Naphthalene	N/A	N/A	5E-09	5E-09	Body weight	N/A	N/A	1E-05	1E-05
			Chemical Total	N/A	N/A	5E-09	5E-09		N/A	N/A	4E-04	4E-04
		Exposure Point Total					**5E-09**					**4E-04**
						Total of Receptor Risks:	**1E-06**				**Total of Receptor HI*:**	**5E-02**

Notes:

***Endpoint-specific HIs are not calculated since combined endpoint HI is < 1.**

< = less than.
COPC = Chemical of potential concern.
HI = Hazard index.
N/A = Not applicable.
PCBs = Polychlorinated biphenyls.
RME = Reasonable Maximum Exposure.
SVOCs = Semivolatile organic compounds.
VOCs = Volatile organic compounds.
Totals are calculated based on unrounded chemical-specific values.

TABLE 3-9.8

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RECREATIONAL USER (OFF-PROJECT RED MAPLE SWAMP/TIDAL STREAM AREA SUBSURFACE SOIL, HYDRIC SURFACE SOIL, SEDIMENT, AND SURFACE WATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Subsurface Soil	Off-Project Red Maple Swamp/ Tidal Stream Area	**Inorganics**									
			Arsenic	6E-07	N/A	8E-08	7E-07	Skin, Vascular	1E-02	N/A	1E-03	1E-02
			SVOCs									
			Benzo(a)Pyrene	4E-07	N/A	1E-07	5E-07	Developmental	3E-03	N/A	8E-04	4E-03
			VOCs									
			Ethylbenzene	4E-09	N/A	N/A	4E-09	Liver, Kidney	3E-05	N/A	N/A	3E-05
			Naphthalene	1E-07	N/A	4E-08	2E-07	Body weight	4E-04	N/A	1E-04	5E-04
			Chemical Total	1E-06	N/A	2E-07	1E-06		1E-02	N/A	2E-03	2E-02
	Fugitive Dust/ Particulates and Volatiles from Subsurface Soil	Off-Project Red Maple Swamp/ Tidal Stream Area	**Inorganics**									
			Arsenic	N/A	2E-11	N/A	2E-11	Developmental, Cardiovascular, Nervous, Respiratory, Skin	N/A	9E-07	N/A	9E-07
			SVOCs									
			Benzo(a)Pyrene	N/A	8E-13	N/A	8E-13	Developmental	N/A	9E-07	N/A	9E-07
			VOCs									
			Ethylbenzene	N/A	2E-09	N/A	2E-09	Developmental	N/A	2E-06	N/A	2E-06
			Naphthalene	N/A	7E-09	N/A	7E-09	Nervous, Respiratory	N/A	2E-04	N/A	2E-04
			Chemical Total	N/A	9E-09	N/A	9E-09		N/A	2E-04	N/A	2E-04
		Exposure Point Total					**1E-06**					**2E-02**
Hydric Soil	Hydric Surface Soil	Off-Project Red Maple Swamp/ Tidal Stream Area	**Inorganics**									
			Arsenic	1E-07	N/A	1E-07	2E-07	Skin, Vascular	2E-03	N/A	2E-03	4E-03
			Thallium	N/A	N/A	N/A	N/A	Hair, Skin	2E-03	N/A	N/A	2E-03
			PCBs									
			Total PCB Aroclors	2E-08	N/A	8E-08	1E-07	Eye, Nails, Immune	5E-03	N/A	2E-02	2E-02
			SVOCs									
			Benzo(a)Pyrene	8E-08	N/A	3E-07	4E-07	Developmental	6E-04	N/A	2E-03	2E-03
			Benzo(b)fluoranthene	1E-08	N/A	3E-08	5E-08	N/A	N/A	N/A	N/A	N/A
			Dibenzo(a,h)Anthracene	2E-08	N/A	5E-08	7E-08	N/A	N/A	N/A	N/A	N/A
			Indeno(1,2,3-CD)Pyrene	1E-08	N/A	4E-08	5E-08	N/A	N/A	N/A	N/A	N/A
			Chemical Total	2E-07	N/A	6E-07	9E-07		9E-03	N/A	2E-02	3E-02
		Exposure Point Total					**9E-07**					**3E-02**

TABLE 3-9.8

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RECREATIONAL USER (OFF-PROJECT RED MAPLE SWAMP/TIDAL STREAM AREA SUBSURFACE SOIL, HYDRIC SURFACE SOIL, SEDIMENT, AND SURFACE WATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	Off-Project Red	**PCBs**									
		Maple Swamp/	Total PCB Aroclors	9E-09	N/A	4E-08	5E-08	Eye, Nails, Immune	2E-03	N/A	7E-03	9E-03
		Tidal Stream Area	Chemical Total	9E-09	N/A	4E-08	5E-08		2E-03	N/A	7E-03	9E-03
		Exposure Point Total					**5E-08**					**9E-03**
Surface Water	Surface Water	Off-Project Red	**VOCs**									
		Maple Swamp/	1,2,3-Trichlorobenzene	N/A	N/A	N/A	N/A	Liver, Thyroid, Reduced body weight	N/A	N/A	4E-04	4E-04
		Tidal Stream Area	Naphthalene	N/A	N/A	5E-09	5E-09	Body weight	N/A	N/A	1E-05	1E-05
			Chemical Total	N/A	N/A	5E-09	5E-09		N/A	N/A	4E-04	4E-04
		Exposure Point Total					**5E-09**					**4E-04**
						Total of Receptor Risks:	**2E-06**				**Total of Receptor HI*:**	**6E-02**

Notes:

***Endpoint-specific HIs are not calculated since combined endpoint HI is < 1.**

< = less than.

COPC = Chemical of potential concern.

HI = Hazard index.

N/A = Not applicable.

PCBs = Polychlorinated biphenyls.

RME = Reasonable Maximum Exposure.

SVOCs = Semivolatile organic compounds.

VOCs = Volatile organic compounds.

Totals are calculated based on unrounded chemical-specific values.

TABLE 3-9.9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - HYPOTHETICAL FUTURE RESIDENT (ON-PROJECT BLUE BEACH AREA SURFACE SOIL AND GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Mortality, Blood	1E-02	N/A	N/A	1E-02
			Cadmium	N/A	N/A	N/A	N/A	Kidney	3E-02	N/A	3E-03	3E-02
			PCBs									
			Total PCB Aroclors	9E-07	N/A	4E-07	1E-06	Eye, Nails, Immune	2E-01	N/A	7E-02	3E-01
			SVOCs									
			Dibenzo(a,h)Anthracene	2E-07	N/A	6E-08	3E-07	N/A	N/A	N/A	N/A	N/A
			Chemical Total	1E-06	N/A	4E-07	1E-06		2E-01	N/A	7E-02	3E-01
	Fugitive Dust/ Particulates and Volatiles from Surface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Respiratory	N/A	9E-07	N/A	9E-07
			Cadmium	N/A	1E-09	N/A	1E-09	Kidney	N/A	2E-04	N/A	2E-04
			PCBs									
			Total PCB Aroclors	N/A	2E-07	N/A	2E-07	N/A	N/A	N/A	N/A	N/A
			SVOCs									
			Dibenzo(a,h)Anthracene	N/A	1E-11	N/A	1E-11	N/A	N/A	N/A	N/A	N/A
			Chemical Total	N/A	2E-07	N/A	2E-07		N/A	2E-04	N/A	2E-04
		Exposure Point Total					**2E-06**					**3E-01**

TABLE 3-9.9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - HYPOTHETICAL FUTURE RESIDENT (ON-PROJECT BLUE BEACH AREA SURFACE SOIL AND GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Mortality, Blood	3E-01	N/A	8E-03	3E-01
			Arsenic	6E-05	N/A	3E-07	6E-05	Skin, Vascular	5E-01	N/A	2E-03	5E-01
			Barium	N/A	N/A	N/A	N/A	Kidney	3E-02	N/A	2E-03	3E-02
			Cadmium	N/A	N/A	N/A	N/A	Kidney	5E-01	N/A	4E-02	5E-01
			Chromium	N/A	N/A	N/A	N/A	None reported	4E-03	N/A	1E-03	5E-03
			Cobalt	N/A	N/A	N/A	N/A	Thyroid	7E-01	N/A	1E-03	7E-01
			Iron	N/A	N/A	N/A	N/A	Gastrointestinal	4E+00	N/A	2E-02	4E+00
			Lead	N/A	N/A	N/A	N/A	See Human Health Risk Assessment Report Text				
			Manganese	N/A	N/A	N/A	N/A	Nervous	7E+00	N/A	7E-01	7E+00
			SVOCs									
			1-Methylnaphthalene	3E-05	N/A	5E-05	8E-05	Respiratory	6E-02	N/A	8E-02	1E-01
			2-Methylnaphthalene	N/A	N/A	N/A	N/A	Respiratory	1E+00	N/A	1E+00	2E+00
			Benzo(a)anthracene	4E-07	N/A	N/A	4E-07	N/A	N/A	N/A	N/A	N/A
			Benzo(a)Pyrene	4E-06	N/A	N/A	4E-06	Developmental	2E-02	N/A	N/A	2E-02
			Benzo(b)fluoranthene	6E-07	N/A	N/A	6E-07	N/A	N/A	N/A	N/A	N/A
			Naphthalene	4E-04	N/A	2E-04	6E-04	Body weight	6E-01	N/A	4E-01	1E+00
			VOCs									
			1,1,2,2-Tetrachloroethane	5E-07	N/A	6E-08	6E-07	Liver	5E-04	N/A	6E-05	6E-04
			1,1,2-Trichloroethane	3E-07	N/A	3E-08	3E-07	Immune, Blood	5E-03	N/A	4E-04	5E-03
			1,1-Dichloroethane	1E-08	N/A	1E-09	2E-08	Kidney	5E-05	N/A	3E-06	5E-05
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	3E-01	N/A	3E-01	6E-01
			1,2-Dichloropropane	4E-07	N/A	4E-08	5E-07	Musculoskeletal	1E-03	N/A	1E-04	1E-03
			Chloroform	8E-08	N/A	7E-09	9E-08	Liver	1E-03	N/A	8E-05	1E-03
			cis-1,2-Dichloroethene	N/A	N/A	N/A	N/A	Kidney	2E-01	N/A	2E-02	2E-01
			Ethylbenzene	1E-07	N/A	7E-08	2E-07	Liver, Kidney	4E-04	N/A	2E-04	7E-04
			Tetrachloroethene	3E-08	N/A	2E-08	4E-08	Nervous, Eye	9E-03	N/A	5E-03	1E-02
			Total Xylenes	N/A	N/A	N/A	N/A	Decreased body weight, Increased mortality	2E-03	N/A	1E-03	3E-03
			Trichloroethylene (kidney effects)	9E-06	N/A	1E-06	1E-05	NA	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	2E-05	N/A	2E-06	2E-05	Developmental, Immune	3E+00	N/A	5E-01	4E+00
			Vinyl Chloride	4E-05	N/A	2E-06	4E-05	Liver	3E-02	N/A	2E-03	3E-02
			Chemical Total	5E-04	N/A	3E-04	8E-04		2E+01	N/A	3E+00	2E+01

TABLE 3-9.9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - HYPOTHETICAL FUTURE RESIDENT (ON-PROJECT BLUE BEACH AREA SURFACE SOIL AND GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shower Air	On-Project Blue Beach Area	**SVOCs**									
			1-Methylnaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			2-Methylnaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Benzo(a)anthracene	N/A	1E-07	N/A	1E-07	N/A	N/A	N/A	N/A	N/A
			Naphthalene	N/A	1E-03	N/A	1E-03	Nervous, Respiratory	N/A	2E+01	N/A	2E+01
			VOCs									
			1,1,2,2-Tetrachloroethane	N/A	1E-06	N/A	1E-06	N/A	N/A	N/A	N/A	N/A
			1,1,2-Trichloroethane	N/A	1E-06	N/A	1E-06	Respiratory	N/A	6E-01	N/A	6E-01
			1,1-Dichloroethane	N/A	6E-08	N/A	6E-08	N/A	N/A	N/A	N/A	N/A
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	N/A	4E-01	N/A	4E-01
			1,2-Dichloropropane	N/A	6E-07	N/A	6E-07	Respiratory	N/A	9E-02	N/A	9E-02
			Chloroform	N/A	8E-07	N/A	8E-07	Liver	N/A	7E-04	N/A	7E-04
			cis-1,2-Dichloroethene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Ethylbenzene	N/A	4E-07	N/A	4E-07	Developmental	N/A	3E-04	N/A	3E-04
			Tetrachloroethene	N/A	5E-08	N/A	5E-08	Nervous, Eye	N/A	9E-03	N/A	9E-03
			Total Xylenes	N/A	N/A	N/A	N/A	Nervous	N/A	3E-02	N/A	3E-02
			Trichloroethylene (kidney effects)	N/A	1E-05	N/A	1E-05	N/A	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	N/A	2E-05	N/A	2E-05	Developmental, Immune	N/A	6E+00	N/A	6E+00
			Vinyl Chloride	N/A	4E-06	N/A	4E-06	Liver	N/A	9E-03	N/A	9E-03
			Chemical Total	N/A	1E-03	N/A	1E-03		N/A	3E+01	N/A	3E+01
		Exposure Point Total					**2E-03**					**5E+01**
						Total of Receptor Risks:	**2E-03**	**Total of Receptor HI (see following table for sum by target endpoint):**				**5E+01**

TABLE 3-9.9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - HYPOTHETICAL FUTURE RESIDENT (ON-PROJECT BLUE BEACH AREA SURFACE SOIL AND GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total

Notes:

COPC = Chemical of potential concern.

HI = Hazard index.

HQ = Hazard quotient.

NHL = Non-Hodgkin's lymphoma.

N/A = Not applicable.

PCBs = Polychlorinated biphenyls.

RME = Reasonable Maximum Exposure.

SVOCs = Semivolatile organic compounds.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

Totals are calculated based on unrounded chemical-specific values.

Green shading indicates the receptor-specific cumulative potential risk and/or HI (per target endpoint) is greater than USEPA's target risk range of 1E-6 to 1E-4 or target HI of 1, respectively. For each associated exposure scenario (i.e., receptor/medium) with a potential risk/HI above USEPA's cumulative target risk/HI level, risk drivers were defined as COPCs with an individual risk > 1E-6 or HQ > 1 . These risk drivers are also highlighted.

Target Endpoint	**Total HI by Target Endpoint**
Total Blood HI =	3E-01
Total Decreased Body and Organ Weights =	1E+00
Total Developmental HI =	1E+01
Total Eye HI =	3E-01
Total Gastrointestinal HI =	4E+00
Total Immune HI =	1E+01
Total Kidney HI =	8E-01
Total Liver HI =	5E-02
Total Mortality HI =	3E-01
Total Musculoskeletal HI =	1E-03
Total Nails HI =	3E-01
Total Nervous System HI =	3E+01
Total None Reported HI =	5E-03
Total Respiratory HI =	2E+01
Total Skin HI =	5E-01
Total Thyroid HI =	7E-01
Total Vascular HI =	5E-01

TABLE 3-9.10

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - HYPOTHETICAL FUTURE RESIDENT (ON-PROJECT BLUE BEACH AREA SUBSURFACE SOIL AND GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Subsurface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Mortality, Blood	1E-02	N/A	N/A	1E-02
			Cadmium	N/A	N/A	N/A	N/A	Kidney	3E-02	N/A	3E-03	3E-02
			PCBs									
			Total PCB Aroclors	4E-07	N/A	1E-07	5E-07	Eye, Nails, Immune	8E-02	N/A	3E-02	1E-01
			VOCs									
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	1E-02	N/A	N/A	1E-02
			Ethylbenzene	3E-07	N/A	N/A	3E-07	Liver, Kidney	2E-03	N/A	N/A	2E-03
			Total Xylenes	N/A	N/A	N/A	N/A	Decreased body weight, Increased mortality	6E-03	N/A	N/A	6E-03
			Trichloroethylene (kidney effects)	4E-08	N/A	N/A	4E-08	N/A	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	4E-08	N/A	N/A	4E-08	Developmental, Immune	2E-02	N/A	N/A	2E-02
			Chemical Total	7E-07	N/A	1E-07	9E-07		2E-01	N/A	3E-02	2E-01
	Fugitive Dust/ Particulates and Volatiles from Subsurface Soil	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Respiratory	N/A	8E-07	N/A	8E-07
			Cadmium	N/A	1E-09	N/A	1E-09	Kidney	N/A	1E-04	N/A	1E-04
			PCBs									
			Total PCB Aroclors	N/A	8E-08	N/A	8E-08	N/A	N/A	N/A	N/A	N/A
			VOCs									
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	N/A	4E-02	N/A	4E-02
			Ethylbenzene	N/A	4E-06	N/A	4E-06	Developmental	N/A	4E-03	N/A	4E-03
			Total Xylenes	N/A	N/A	N/A	N/A	Nervous	N/A	3E-01	N/A	3E-01
			Trichloroethylene (kidney effects)	N/A	4E-07	N/A	4E-07	N/A	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	N/A	6E-07	N/A	6E-07	Developmental, Immune	N/A	2E-01	N/A	2E-01
			Chemical Total	N/A	5E-06	N/A	5E-06		N/A	6E-01	N/A	6E-01
		Exposure Point Total					**6E-06**					**7E-01**

TABLE 3-9.10

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - HYPOTHETICAL FUTURE RESIDENT (ON-PROJECT BLUE BEACH AREA SUBSURFACE SOIL AND GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	On-Project Blue Beach Area	**Inorganics**									
			Antimony	N/A	N/A	N/A	N/A	Mortality, Blood	3E-01	N/A	8E-03	3E-01
			Arsenic	6E-05	N/A	3E-07	6E-05	Skin, Vascular	5E-01	N/A	2E-03	5E-01
			Barium	N/A	N/A	N/A	N/A	Kidney	3E-02	N/A	2E-03	3E-02
			Cadmium	N/A	N/A	N/A	N/A	Kidney	5E-01	N/A	4E-02	5E-01
			Chromium	N/A	N/A	N/A	N/A	None reported	4E-03	N/A	1E-03	5E-03
			Cobalt	N/A	N/A	N/A	N/A	Thyroid	7E-01	N/A	1E-03	7E-01
			Iron	N/A	N/A	N/A	N/A	Gastrointestinal	4E+00	N/A	2E-02	4E+00
			Lead	N/A	N/A	N/A	N/A	See Human Health Risk Assessment Report Text				
			Manganese	N/A	N/A	N/A	N/A	Nervous	7E+00	N/A	7E-01	7E+00
			SVOCs									
			1-Methylnaphthalene	3E-05	N/A	5E-05	8E-05	Respiratory	6E-02	N/A	8E-02	1E-01
			2-Methylnaphthalene	N/A	N/A	N/A	N/A	Respiratory	1E+00	N/A	1E+00	2E+00
			Benzo(a)anthracene	4E-07	N/A	N/A	4E-07	N/A	N/A	N/A	N/A	N/A
			Benzo(a)Pyrene	4E-06	N/A	N/A	4E-06	Developmental	2E-02	N/A	N/A	2E-02
			Benzo(b)fluoranthene	6E-07	N/A	N/A	6E-07	N/A	N/A	N/A	N/A	N/A
			Naphthalene	4E-04	N/A	2E-04	6E-04	Body weight	6E-01	N/A	4E-01	1E+00
			VOCs									
			1,1,2,2-Tetrachloroethane	5E-07	N/A	6E-08	6E-07	Liver	5E-04	N/A	6E-05	6E-04
			1,1,2-Trichloroethane	3E-07	N/A	3E-08	3E-07	Immune, Blood	5E-03	N/A	4E-04	5E-03
			1,1-Dichloroethane	1E-08	N/A	1E-09	2E-08	Kidney	5E-05	N/A	3E-06	5E-05
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	3E-01	N/A	3E-01	6E-01
			1,2-Dichloropropane	4E-07	N/A	4E-08	5E-07	Musculoskeletal	1E-03	N/A	1E-04	1E-03
			Chloroform	8E-08	N/A	7E-09	9E-08	Liver	1E-03	N/A	8E-05	1E-03
			cis-1,2-Dichloroethene	N/A	N/A	N/A	N/A	Kidney	2E-01	N/A	2E-02	2E-01
			Ethylbenzene	1E-07	N/A	7E-08	2E-07	Liver, Kidney	4E-04	N/A	2E-04	7E-04
			Tetrachloroethene	3E-08	N/A	2E-08	4E-08	Nervous, Eye	9E-03	N/A	5E-03	1E-02
			Total Xylenes	N/A	N/A	N/A	N/A	Decreased body weight, Increased mortality	2E-03	N/A	1E-03	3E-03
			Trichloroethylene (kidney effects)	9E-06	N/A	1E-06	1E-05	NA	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	2E-05	N/A	2E-06	2E-05	Developmental, Immune	3E+00	N/A	5E-01	4E+00
			Vinyl Chloride	4E-05	N/A	2E-06	4E-05	Liver	3E-02	N/A	2E-03	3E-02
			Chemical Total	5E-04	N/A	3E-04	8E-04		2E+01	N/A	3E+00	2E+01

TABLE 3-9.10

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - HYPOTHETICAL FUTURE RESIDENT (ON-PROJECT BLUE BEACH AREA SUBSURFACE SOIL AND GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Shower Air	On-Project Blue Beach Area	**SVOCs**									
			1-Methylnaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			2-Methylnaphthalene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Benzo(a)anthracene	N/A	1E-07	N/A	1E-07	N/A	N/A	N/A	N/A	N/A
			Naphthalene	N/A	1E-03	N/A	1E-03	Nervous, Respiratory	N/A	2E+01	N/A	2E+01
			VOCs									
			1,1,2,2-Tetrachloroethane	N/A	1E-06	N/A	1E-06	N/A	N/A	N/A	N/A	N/A
			1,1,2-Trichloroethane	N/A	1E-06	N/A	1E-06	Respiratory	N/A	6E-01	N/A	6E-01
			1,1-Dichloroethane	N/A	6E-08	N/A	6E-08	N/A	N/A	N/A	N/A	N/A
			1,2,4-Trimethylbenzene	N/A	N/A	N/A	N/A	Nervous	N/A	4E-01	N/A	4E-01
			1,2-Dichloropropane	N/A	6E-07	N/A	6E-07	Respiratory	N/A	9E-02	N/A	9E-02
			Chloroform	N/A	8E-07	N/A	8E-07	Liver	N/A	7E-04	N/A	7E-04
			cis-1,2-Dichloroethene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			Ethylbenzene	N/A	4E-07	N/A	4E-07	Developmental	N/A	3E-04	N/A	3E-04
			Tetrachloroethene	N/A	5E-08	N/A	5E-08	Nervous, Eye	N/A	9E-03	N/A	9E-03
			Total Xylenes	N/A	N/A	N/A	N/A	Nervous	N/A	3E-02	N/A	3E-02
			Trichloroethylene (kidney effects)	N/A	1E-05	N/A	1E-05	N/A	N/A	N/A	N/A	N/A
			Trichloroethylene (NHL+liver effects)	N/A	2E-05	N/A	2E-05	Developmental, Immune	N/A	6E+00	N/A	6E+00
			Vinyl Chloride	N/A	4E-06	N/A	4E-06	Liver	N/A	9E-03	N/A	9E-03
			Chemical Total	N/A	1E-03	N/A	1E-03		N/A	3E+01	N/A	3E+01
		Exposure Point Total					**2E-03**					**5E+01**
						Total of Receptor Risks:	**2E-03**	**Total of Receptor HI (see following table for sum by target endpoint):**				**5E+01**

TABLE 3-9.10

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - HYPOTHETICAL FUTURE RESIDENT (ON-PROJECT BLUE BEACH AREA SUBSURFACE SOIL AND GROUNDWATER)

REASONABLE MAXIMUM EXPOSURE

HUMAN HEALTH RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total

Notes:

COPC = Chemical of potential concern.

HI = Hazard index.

HQ = Hazard quotient.

N/A = Not applicable.

NHL = Non-Hodgkin's lymphoma.

PCBs = Polychlorinated biphenyls.

RME = Reasonable Maximum Exposure.

SVOCs = Semivolatile organic compounds.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

Totals are calculated based on unrounded chemical-specific values.

Green shading indicates the receptor-specific cumulative potential risk and/or HI (per target endpoint) is greater than USEPA's target risk range of 1E-6 to 1E-4 or target HI of 1, respectively. For each associated exposure scenario (i.e., receptor/medium) with a potential risk/HI above USEPA's cumulative target risk/HI level, risk drivers were defined as COPCs with an individual risk > 1E-6 or HQ > 1 . These risk drivers are also highlighted.

Target Endpoint	**Total HI by Target Endpoint**
Total Blood HI =	3E-01
Total Decreased Body and Organ Weights =	1E+00
Total Developmental HI =	1E+01
Total Eye HI =	1E-01
Total Gastrointestinal HI =	4E+00
Total Immune HI =	1E+01
Total Kidney HI =	8E-01
Total Liver HI =	5E-02
Total Mortality HI =	3E-01
Total Musculoskeletal HI =	1E-03
Total Nails HI =	1E-01
Total Nervous System HI =	3E+01
Total None Reported HI =	5E-03
Total Respiratory HI =	2E+01
Total Skin HI =	5E-01
Total Thyroid HI =	7E-01
Total Vascular HI =	5E-01

TABLE 3-10.1
RISK/HAZARD SUMMARY - HYPOTHETICAL FUTURE RESIDENT
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	On-Project	**Inorganics**									
		Blue Beach	Arsenic	6E-05	N/A	3E-07	6E-05					
		Area	Iron					Gastrointestinal	4E+00	N/A	2E-02	4E+00
			Lead					See Human Health Risk Assessment Report Text				
			Manganese					Nervous	7E+00	N/A	7E-01	7E+00
			SVOCs									
			1-Methylnaphthalene	3E-05	N/A	5E-05	8E-05					
			2-Methylnaphthalene					Respiratory	1E+00	N/A	1E+00	2E+00
			Benzo(a)Pyrene	4E-06	N/A	N/A	4E-06					
			Naphthalene	4E-04	N/A	2E-04	6E-04					
			VOCs									
			Trichloroethylene (kidney effects)	9E-06	N/A	1E-06	1E-05					
			Trichloroethylene (NHL+liver effects)	2E-05	N/A	2E-06	2E-05	Developmental, Immune	3E+00	N/A	5E-01	4E+00
			Vinyl Chloride	4E-05	N/A	2E-06	4E-05					
			Chemical Total	5E-04	N/A	3E-04	8E-04		2E+01	N/A	3E+00	2E+01
	Shower Air	On-Project	**SVOCs**									
		Blue Beach	Naphthalene	N/A	1E-03	N/A	1E-03	Nervous, Respiratory	N/A	2E+01	N/A	2E+01
		Area	**VOCs**									
			Trichloroethylene (kidney effects)	N/A	1E-05	N/A	1E-05					
			Trichloroethylene (NHL+liver effects)	N/A	2E-05	N/A	2E-05	Developmental, Immune	N/A	6E+00	N/A	6E+00
			Vinyl Chloride	N/A	4E-06	N/A	4E-06					
			Chemical Total	N/A	1E-03	N/A	1E-03		N/A	3E+01	N/A	3E+01
		Exposure Point Total					**2E-03**					**4E+01**
						Total of Receptor Risks:	**2E-03**	**Total of Receptor HI (see following table for sum by target endpoint):**				**4E+01**

TABLE 3-10.1
RISK/HAZARD SUMMARY - HYPOTHETICAL FUTURE RESIDENT
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult and Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk Young Child + Adult				Non-Carcinogenic Hazard Quotient Young Child				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total

Notes:
COPC = Chemical of potential concern.
HI = Hazard index.
NHL = Non-Hodgkin's lymphoma.
N/A = Not applicable.
RME = Reasonable Maximum Exposure.
SVOCs = Semivolatile organic compounds.
VOCs = Volatile organic compounds.
Totals are calculated based on unrounded chemical-specific values.

Target Endpoint	**Total HI by Target Endpoint**
Total Developmental HI =	1E+01
Total Gastrointestinal HI =	4E+00
Total Immune HI =	1E+01
Total Nervous System HI =	3E+01
Total Respiratory HI =	2E+01

TABLE 3-11
SUMMARY OF RECEPTOR RISKS AND HAZARDS
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Exposure Point	Scenario/ Receptor	Exposure Media	Total Cancer Risks	Total Noncancer HI (a)	Media with Risk > 1E-04 or HI > 1	Major Contributors to Risk (> 1E-06, HQ > 1) (b)(c)
On-Project Blue Beach Area	Current/Future Construction/Utility Worker	Surface Soil (0 - 1 feet); Shallow Groundwater	1E-06	5E-01	N/A	
	Current/Future Construction/Utility Worker	Subsurface Soil (1 - 15 feet); Shallow Groundwater	1E-06	5E-01	N/A	
	Current/Future Outdoor Worker	Surface Soil (0 - 1 feet)	4E-07	2E-02	N/A	
	Future Outdoor Worker	Subsurface Soil (1 - 15 feet)	1E-06	1E-01	N/A	
	Future Indoor Worker	Soil Vapor	5E-06	7E-02	N/A	
	Current/Future Trespasser (Adolescent)	Surface Soil (0 - 1 feet)	2E-08	4E-03	N/A	
	Future Trespasser (Adolescent)	Subsurface Soil (1 - 15 feet)	3E-08	8E-03	N/A	
	Future Hypothetical Resident (Adult/Child)	Surface Soil (0 - 1 feet); Groundwater	**2E-03**	**5E+01**	Groundwater (d)	Cancer: Arsenic, 1-Methylnaphthalene, Benzo(a)Pyrene, Naphthalene, Trichloroethylene, Vinyl chloride; Non-cancer: Iron, Lead, Manganese, 2-Methylnaphthalene, Naphthalene, Trichloroethylene
	Future Hypothetical Resident (Adult/Child)	Subsurface Soil (1 - 15 feet); Groundwater	**2E-03**	**5E+01**	Groundwater (d)	Cancer: Arsenic, 1-Methylnaphthalene, Benzo(a)Pyrene, Naphthalene, Trichloroethylene, Vinyl chloride; Non-cancer: Iron, Lead, Manganese, 2-Methylnaphthalene, Naphthalene, Trichloroethylene
	Future Hypothetical Resident (Adult/Child)	Soil Vapor	5E-05	3E-01	N/A	
Off-Project Red Maple Swamp/Tidal Stream Area	Current/Future Recreational User (Adult/Child)	Surface Soil (0 - 1 feet); Hydric Surface Soil (0 - 1 feet); Sediment; Surface Water	1E-06	5E-02	N/A	
	Current/Future Recreational User (Adult/Child)	Subsurface Soil (1 - 15 feet); Hydric Surface Soil (0 - 1 feet); Sediment; Surface Water	2E-06	6E-02	N/A	
Off-Project Narragansett Bay and Beachfront Area	Current/Future Recreational User (Adult/Child)	Sediment; Surface Water	NC	NC	N/A	

TABLE 3-11
SUMMARY OF RECEPTOR RISKS AND HAZARDS
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Exposure Point	Scenario/ Receptor	Exposure Media	Total Cancer Risks	Total Noncancer HI (a)	Media with Risk > 1E-04 or HI > 1	Major Contributors to Risk (> 1E-06, HQ > 1) (b)(c)

Notes:
> = Greater than.
HI = Hazard Index.
HQ = Hazard Quotient.
N/A = Not Applicable.
NC = Not Calculated; No chemicals of potential concern identified in this area.
USEPA = United States Environmental Protection Agency.
Bolded values indicate the receptor-specific cumulative potential risk and/or HI (per target endpoint) is greater than USEPA's target risk range of 1E-06 to 1E-04 or target HI of 1, respectively.
(a) The presented total noncancer HI is the combined total for all target endpoints. See Table 9s for the total HIs per target endpoint.
(b) Major contributors to risk are identified where the receptor-specific cumulative risk and/or total HI (per target endpoint) exceed USEPA target levels. Major contributors to risk are then defined per exposure scenario (i.e., RME/receptor/medium) as a chemical with an individual risk > 1E-06 or a HQ > 1 .
(c) Lead is identified as a risk driver in groundwater within the on-Project Blue Beach area for a hypothetical future on-Project resident scenario based on the exposure point concentration that exceeds the Safe Drinking Water Act (SDWA) action level.
(d) The associated exposure scenario assumes groundwater is used for potable use (as drinking water and for showering/bathing) under a hypothetical future scenario in which the environmental land-use restriction (ELUR) is removed and the area is redeveloped for residential use. An ELUR prohibiting residential use and potable use of groundwater within the on-Project Blue Beach Area has been recorded. This scenario was evaluated to represent an unlimited use/unrestricted exposure (UU/UE) scenario for informational purposes.

TABLE 4-1
ECOLOGICAL SCREENING VALUES - SOIL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	Surface Soil Screening Levels (mg/kg)								
Constituent	**Invertebrates**			**Plants**			**Wildlife**		
INORGANICS									
Aluminum	pH<5.5	[a]	Eco-SSL	pH<5.5	[a]	Eco-SSL	pH<5.5	[a]	Eco-SSL
Antimony	78	[a]	Eco-SSL (inverts)	5	[b]	ORNL (plants)	0.27	[a]	Eco-SSL (mammals)
Arsenic	60	[b]	ORNL (inverts)	18	[a]	Eco-SSL (plants)	43	[a]	Eco-SSL (birds)
Barium	330	[a]	Eco-SSL (inverts)	500	[b]	ORNL (plants)	2000	[a]	Eco-SSL (mammals)
Beryllium	40	[a]	Eco-SSL (inverts)	10	[b]	ORNL (plants)	21	[a]	Eco-SSL (mammals)
Cadmium	140	[a]	Eco-SSL (inverts)	32	[a]	Eco-SSL (plants)	0.36	[a]	Eco-SSL (mammals)
Calcium	NV			NV			NV		
Chromium	0.4	[b]	ORNL (inverts)	1	[b]	ORNL (plants)	26	[a]	Eco-SSL (birds)
Cobalt	2.4	[c]	TV (unspecified)	13	[a]	Eco-SSL (plants)	120	[a]	Eco-SSL (birds)
Copper	80	[a]	Eco-SSL (inverts)	70	[a]	Eco-SSL (plants)	28	[a]	Eco-SSL (birds)
Iron	pH<5, pH>8	[a]	Eco-SSL	pH<5, pH>8	[a]	Eco-SSL	NV		
Lead	1700	[a]	Eco-SSL (inverts)	120	[a]	Eco-SSL (plants)	11	[a]	Eco-SSL (birds)
Magnesium	NV			NV			NV		
Manganese	450	[a]	Eco-SSL (inverts)	220	[a]	Eco-SSL (plants)	4000	[a]	Eco-SSL (mammals)
Mercury	0.1	[b]	ORNL (inverts)	0.3	[b]	ORNL (plants)	0.013	[d]	USEPA R4 (birds)
Nickel	280	[a]	Eco-SSL (inverts)	38	[a]	Eco-SSL (plants)	130	[a]	Eco-SSL (mammals)
Potassium	NV			NV			NV		
Selenium	4.1	[a]	Eco-SSL (inverts)	0.52	[a]	Eco-SSL (plants)	0.63	[a]	Eco-SSL (mammals)
Silver	15	[c]	IV (unspecified)	560	[a]	Eco-SSL (plants)	4.2	[a]	Eco-SSL (birds)
Sodium	NV			NV			NV		
Thallium	1	[c]	TV (unspecified)	1	[b]	ORNL (plants)	0.22	[d]	USEPA R4 (mammals)
Vanadium	42	[c]	TV (unspecified)	2	[b]	ORNL (plants)	7.8	[a]	Eco-SSL (birds)
Zinc	120	[a]	Eco-SSL (inverts)	160	[a]	Eco-SSL (plants)	46	[a]	Eco-SSL (birds)
POLYCHLORINATED BIPHENYLS (PCBs)									
Aroclor 1260	0.02	[c, f]	TV (unspecified)	40	[b,f]	ORNL (plants)	0.041	[d, f]	USEPA R4 (birds)
Total PCB Aroclors	0.02	[c]	TV (unspecified)	40	[b]	ORNL (plants)	0.041	[d]	USEPA R4 (birds)
SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs)									
1-Methylnaphthalene	0.14	[d]	USEPA R4 (inverts)	NV			NV		
2,4-Dichlorophenol	0.01	[c]	TV (unspecified)	0.01	[c]	TV (unspecified)	87.5	[d]	USEPA R4 (mammals)
2-Methylnaphthalene	0.11	[d]	USEPA R4 (inverts)	NV			16	[d]	USEPA R4 (mammals)
Acenaphthene	0.38	[d]	USEPA R4 (inverts)	0.25	[d]	USEPA R4 (plants)	130	[d]	USEPA R4 (mammals)
Acenaphthylene	0.34	[d]	USEPA R4 (inverts)	NV			120	[d]	USEPA R4 (mammals)
Anthracene	0.0015	[d]	USEPA R4 (inverts)	6.8	[d]	USEPA R4 (plants)	210	[d]	USEPA R4 (mammals)
Benzo(a)anthracene	18	[a, g]	Eco-SSL (inverts)	18	[d]	USEPA R4 (plants)	1.1	[a, g]	Eco-SSL (mammals)
Benzo(a)Pyrene	18	[a, g]	Eco-SSL (inverts)	NV			1.1	[a, g]	Eco-SSL (mammals)
Benzo(b)fluoranthene	18	[a, g]	Eco-SSL (inverts)	18	[d]	USEPA R4 (plants)	1.1	[a, g]	Eco-SSL (mammals)
Benzo(g,h,i)Perylene	18	[a, g]	Eco-SSL (inverts)	NV			1.1	[a, g]	Eco-SSL (mammals)
Benzo(k)Fluoranthene	18	[a, g]	Eco-SSL (inverts)	NV			1.1	[a, g]	Eco-SSL (mammals)
Benzoic acid	0.01	[d]	USEPA R4 (inverts)	NV			1	[d]	USEPA R4 (mammals)
Bis-(2-Ethylhexyl)-Phthalate	0.1	[c]	TV (unspecified)	0.1	[c]	TV (unspecified)	0.02	[d]	USEPA R4 (birds)
Chrysene	18	[a, g]	Eco-SSL (inverts)	NV			1.1	[a, g]	Eco-SSL (mammals)
Dibenzo(a,h)Anthracene	0.06	[d]	USEPA R4 (inverts)	NV			14	[d]	USEPA R4 (mammals)
Fluoranthene	29	[a, h]	Eco-SSL (inverts)	NV			100	[a, h]	Eco-SSL (mammals)
Fluorene	30	[b]	ORNL (inverts)	NV			250	[d]	USEPA R4 (mammals)
Indeno(1,2,3-CD)Pyrene	18	[a, g]	Eco-SSL (inverts)	NV			1.1	[a, g]	Eco-SSL (mammals)
Naphthalene	0.16	[d]	USEPA R4 (inverts)	1	[d]	USEPA R4 (plants)	3.4	[d]	USEPA R4 (birds)
Phenanthrene	29	[a, h]	Eco-SSL (inverts)	NV			100	[a, h]	Eco-SSL (mammals)
Pyrene	18	[a, g]	Eco-SSL (inverts)	NV			1.1	[a, g]	Eco-SSL (mammals)
Total HMW PAHs	18	[a]	Eco-SSL (inverts)	NV			1.1	[a]	Eco-SSL (mammals)
Total LMW PAHs	29	[a]	Eco-SSL (inverts)	NV			100	[a]	Eco-SSL (mammals)
VOLATILE ORGANIC COMPOUNDS (VOCs)									
2-Butanone (MEK)	1	[d]	USEPA R4 (inverts)	NV			350	[d]	USEPA R4 (mammals)
4-Isopropyltoluene	0.01	[c, e]	TV (unspecified)	200	[b, e]	ORNL (plants)	23	[d, e]	USEPA R4 (mammals)
Acetone	0.04		USEPA R4 (inverts)	NV			1.2	[d]	USEPA R4 (mammals)
Carbon Disulfide	0.005	[d]	USEPA R4 (inverts)	NV			0.81	[d]	USEPA R4 (mammals)
Toluene	0.01	[c]	TV (unspecified)	200	[b]	ORNL (plants)	23	[d]	USEPA R4 (mammals)

Notes:
All screening values reported in milligrams per kilogram (mg/kg).
HMW - High Molecular Weight.
LMW - Low Molecular Weight.
NV - No value identified.
PAH - Polycyclic Aromatic Hydrocarbon.
USEPA - United States Environmental Protection Agency.

Soil screening values were selected according to the following sources:

[a] - USEPA Soil Screening Levels (Eco-SSLs) derived in accordance with USEPA guidance (USEPA, 2005c) and available on-line

[b] - Oak Ridge National Laboratory (ORNL) terrestrial plant and invertebrate (earthworm) screening values (Efroymson, et al. 1997a, 1997b). Values for soil microorganisms and microbial processes (Efroymson et al. 1997b) were selected in cases when earthworm-based values are not available

[c] - National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Table values (Buchman, 2008). Dutch Intervention Values (IV) and Target Values (TV).

[d] - USEPA Region 4 ecological screening value for soil (USEPA, 2018).

[e] - Value for toluene was used as a surrogate due to structural similarities.

[f] - Value provided is for total PCBs.

[g] - Value provided is for total HMW PAHs.

[h] - Value provided is for total LMW PAHs.

TABLE 4-2
ECOLOGICAL SCREENING VALUES - SEDIMENT
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	Off-Project Narragansett Bay and Beachfront Area Screening Values (mg/kg)			Off-Project Red Maple Swamp / Tidal Stream Area Screening Values (mg/kg)		
Constituent						
Aluminum	NV			NV		
Antimony	2	[a]	USEPA R3 (freshwater)	2	[a]	USEPA R3 (freshwater)
Arsenic	7.24	[a]	USEPA R3 (marine)	7.24	[a]	USEPA R3 (marine)
Barium	48	[b]	NOAA marine (AET)	48	[b]	NOAA marine (AET)
Beryllium	NV			NV		
Cadmium	0.68	[a]	USEPA R3 (marine)	0.68	[a]	USEPA R3 (marine)
Chromium	52.3	[a]	USEPA R3 (marine)	43.4	[a]	USEPA R3 (freshwater)
Cobalt	10	[b]	NOAA marine (AET)	10	[b]	NOAA marine (AET)
Copper	18.7	[a]	USEPA R3 (marine)	18.7	[a]	USEPA R3 (marine)
Iron	NV			NV		
Lead	30.2	[a]	USEPA R3 (marine)	30.2	[a]	USEPA R3 (marine)
Magnesium	NV			NV		
Manganese	260	[b]	NOAA marine (AET)	260	[b]	NOAA marine (AET)
Mercury	0.13	[a]	USEPA R3 (marine)	0.13	[a]	USEPA R3 (marine)
Nickel	15.9	[a]	USEPA R3 (marine)	15.9	[a]	USEPA R3 (marine)
Potassium	NV			NV		
Selenium	1	[b]	NOAA marine (AET)	1	[b]	NOAA marine (AET)
Silver	0.73	[a]	USEPA R3 (marine)	0.73	[a]	USEPA R3 (marine)
Sodium	NV			NV		
Thallium	NV			NV		
Vanadium	57	[b]	NOAA marine (AET)	57	[b]	NOAA marine (AET)
Zinc	124	[a]	USEPA R3 (marine)	121	[a]	USEPA R3 (freshwater)
PESTICIDES AND POLYCHLORINATED BIPHENYLS (PCBs)						
Aroclor 1260	0.04	[a, c]	USEPA R3 (marine)	0.04	[a, c]	USEPA R3 (marine)
Total PCB Aroclors	0.04	[a]	USEPA R3 (marine)	0.04	[a]	USEPA R3 (marine)
SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs)						
1-Methylnaphthalene	0.021	[b]	NOAA marine (T20)	0.021	[b]	NOAA marine (T20)
2-Methylnaphthalene	0.0202	[a]	USEPA R3 (marine)	0.0202	[a]	USEPA R3 (freshwater)
Acenaphthene	0.00671	[a]	USEPA R3 (marine)	0.00670	[a]	USEPA R3 (freshwater)
Acenaphthylene	0.00587	[a]	USEPA R3 (marine)	0.00587	[a]	USEPA R3 (marine)
Anthracene	0.0469	[a]	USEPA R3 (marine)	0.0469	[a]	USEPA R3 (marine)
Benzo(a)anthracene	0.0748	[a]	USEPA R3 (marine)	0.0748	[a]	USEPA R3 (marine)
Benzo(a)pyrene	0.0888	[a]	USEPA R3 (marine)	0.0888	[a]	USEPA R3 (marine)
Benzo(b)fluoranthene	0.13	[b]	NOAA marine (T20)	0.13	[b]	NOAA marine (T20)
Benzo(g,h,i)perylene	0.067	[b]	NOAA marine (T20)	0.067	[b]	NOAA marine (T20)
Benzo(k)Fluoranthene	0.07	[b]	NOAA marine (T20)	0.07	[b]	NOAA marine (T20)
Bis-(2-Ethylhexyl)-Phthalate	0.18	[a]	USEPA R3 (marine)	0.18	[a]	USEPA R3 (freshwater)
Carbazole	0.0212	[a, f]	USEPA R3 (marine)	0.0212	[a, f]	USEPA R3 (marine)
Chrysene	0.108	[a]	USEPA R3 (marine)	0.0571	[b]	NOAA FW (TEL)
Dibenzo(a,h)anthracene	0.00622	[a]	USEPA R3 (marine)	0.00622	[a]	USEPA R3 (marine)
Fluoranthene	0.113	[a]	USEPA R3 (marine)	0.111	[b]	NOAA FW (TEL)
Fluorene	0.0212	[a]	USEPA R3 (marine)	0.0212	[a]	USEPA R3 (marine)
Indeno(1,2,3-cd)pyrene	0.068	[b]	NOAA marine (T20)	0.017	[a]	USEPA R3 (freshwater)
Naphthalene	0.0346	[a]	USEPA R3 (marine)	0.0346	[a]	USEPA R3 (marine)
Phenanthrene	0.0867	[a]	USEPA R3 (marine)	0.0867	[a]	USEPA R3 (marine)
Pyrene	0.153	[a]	USEPA R3 (marine)	0.053	[b]	NOAA FW (TEL)
Total HMW PAHs	0.655	[b]	NOAA marine (TEL)	0.19	[a]	USEPA R3 (freshwater)
Total LMW PAHs	0.312	[b]	NOAA marine (TEL)	0.076	[a]	USEPA R3 (freshwater)
Total PAHs	1.684	[b]	NOAA marine (TEL)	1.61	[a]	USEPA R3 (freshwater)
VOLATILE ORGANIC COMPOUNDS (VOCs)						
2-Butanone	NV			NV		
Acetone	NV			NV		
Bromomethane	NV			NV		
Carbon Disulfide	0.000851	[a, d]	USEPA R3 (freshwater)	0.000851	[a]	USEPA R3 (freshwater)
Cis-1,2-Dichloroethene	NV			NV		
Isopropylbenzene	0.086	[a, d]	USEPA R3 (freshwater)	0.086	[a]	USEPA R3 (freshwater)
Sec-Butylbenzene	0.137	[a, e]	USEPA R3 (marine)	0.137	[a, e]	USEPA R3 (marine)
Tert-Butylbenzene	0.137	[a, e]	USEPA R3 (marine)	0.137	[a, e]	USEPA R3 (marine)
Toluene	1.09	[a]	USEPA R3 (marine)	1.09	[a]	USEPA R3 (marine)

Notes:
NV - No value available.
Sediment screening values were selected according to the following hierarchy of sources:
[a] USEPA Region III BTAG sediment screening values (USEPA, 2006); and
[b] National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Table values (Buchman, 2008).
Marine sediment ESVs were selected preferentially for the Off-Project Narragansett Bay and Beach Front Area. If marine values were not available, then freshwater screening values were selected from the above hierarchy.
For the Off-Project Red Maple Swamp/Tidal Stream area, the lower of the freshwater and marine ESVs was selected.
[c] Value for Total PCBs used as a surrogate due to structural similarities.
[d] Freshwater value selected when marine value not identified.
[e] Value for benzene used as a surrogate due to structural similarities.
[f] Value for fluorene used as a surrogate due to structural similarities.

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TABLE 4-3
ECOLOGICAL SCREENING VALUES - SURFACE WATER
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Constituent	Off-Project Narragansett Bay and Beachfront Area Screening Values (ug/L)			Off-Project Red Maple Swamp / Tidal Stream Area Screening Values (ug/L)		
Antimony						
Arsenic	36	[a]	AWQC (Marine)	36	[a]	AWQC (Marine)
Barium	4	[b, f]	USEPA R3 (Freshwater)	4	[b]	USEPA R3 (Freshwater)
Cadmium	7.9	[a]	AWQC (Marine)	1.13	[a, c, d]	AWQC (Freshwater)
Chromium	50	[a]	AWQC (Marine)	11	[a, e]	AWQC (Freshwater)
Lead	5.6	[a]	AWQC (Marine)	4.83	[a, c, d]	AWQC (Freshwater)
Selenium	71	[a]	AWQC (Marine)	71	[a]	AWQC (Marine)
Silver	0.23	[b]	USEPA R3 (Marine)	0.23	[a]	USEPA R3 (Marine)
VOLATILE ORGANIC COMPOUNDS (VOCs)						
1,1,2,2-Tetrachloroethane	90.2	[b]	USEPA R3 (Marine)	90.2	[b]	USEPA R3 (Marine)
1,1-Dichloroethene	2240	[b]	USEPA R3 (Marine)	25	[b]	USEPA R3 (Freshwater)
1,2,3-Trichlorobenzene	110	[b, g]	USEPA R3 (Marine)	110	[b, g]	USEPA R3 (Marine)
Acetone	564000	[b]	USEPA R3 (Marine)	1500	[b]	USEPA R3 (Freshwater)
Benzene	110	[b]	USEPA R3 (Marine)	110	[b]	USEPA R3 (Marine)
Carbon Disulfide	0.92	[b, f]	USEPA R3 (Freshwater)	0.92	[b]	USEPA R3 (Freshwater)
Cis-1,2-Dichloroethene	970	[b, f, h]	USEPA R3 (Freshwater)	970	[b,h]	USEPA R3 (Freshwater)
Isopropylbenzene	110	[b, g]	USEPA R3 (Marine)	2.6	[b]	USEPA R3 (Freshwater)
Naphthalene	1.4	[b]	USEPA R3 (Marine)	1.1	[b]	USEPA R3 (Freshwater)
O-Xylene	NV			NV		
Sec-Butylbenzene	110	[b, g]	USEPA R3 (Marine)	110	[b, g]	USEPA R3 (Marine)
Tert-Butylbenzene	110	[b, g]	USEPA R3 (Marine)	110	[b, g]	USEPA R3 (Marine)
Toluene	215	[b]	USEPA R3 (Marine)	2	[b]	USEPA R3 (Freshwater)
Trans-1,2-Dichloroethene	970	[b, f]	USEPA R3 (Freshwater)	970	[b]	USEPA R3 (Freshwater)
Trichloroethene	21	[b, f]	USEPA R3 (Freshwater)	21	[b]	USEPA R3 (Freshwater)
Vinyl Chloride	930	[b, f]	USEPA R3 (Freshwater)	930	[b]	USEPA R3 (Freshwater)
Xylenes (Total)	19	[b]	USEPA R3 (Marine)	13	[b]	USEPA R3 (Freshwater)

Notes:
NV - No value available.
Marine and freshwater surface water screening values were selected according to the following hierarchy of sources:
[a] Chronic federal Ambient Water Quality Criteria (AWQC) (USEPA, 2020).
[b] USEPA Region III Biological Technical Assistance Group (BTAG) surface water screening values (USEPA, 2006a, b).
Marine surface water ESVs were selected preferentially for the Off-Project Narragansett Bay and Beach Front Area. If marine values were not available, then freshwater screening values were selected from the above hierarchy.
For the Off-Project Red Maple Swamp/Tidal Stream area, the lower of the freshwater and marine ESVs was selected.
[c] Value presented has been adjusted by a hardness of 183 mg/L, which is the average hardness for the Red Maple Swamp / tidal stream area.
[d] Value is for dissolved phase.
[e] Value is for hexavalent chromium (trivalent chromium value is higher).
[f] Freshwater value selected when marine value not identified.
[g] Value for benzene used as surrogate due to structural similarities.
[h] Value for trans1,2-dichloroethene used as a surrogate due to structural similarities.

TABLE 4-4
SELECTION OF SURFACE SOIL COPCS - ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
NORTH KINGSTOWN, RHODE ISLAND
BLUE BEACH DISPOSAL AREA

							ESV Evaluation			Background Evaluation						
Detected Constituent	**Frequency of Detection [a]**	**Percent Detected**	**Minimum**	**Maximum**	**Location of Maximum Concentration**	**ESV for COPC Selection [b]**	**Preliminary COPC Based on ESV Comparison**	**Rationale**	**BTV [d]**	**BTV Comparision**	**Two-Sample Hypothesis [e]**	**Geochemical Analysis [f]**	**Consistent with Background?**	**COPC**	**Maximum HQ**
Inorganics															
Aluminum	27 - 27	100%	2810	11900	SB-319 (0 - 1 ft)	pH<5.5	**YES**	No ESV	13935	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Antimony	27 - 27	100%	0.028 J	3.1	SB-BG-1 (0 - 1 ft)	0.27	**YES**	Max > ESV	0.14	Max>BTV	Site > Background	Not Consistent	NO	**YES**	**11.6**
Arsenic	27 - 27	100%	1.3	4.4	SB-303 (0 - 1 ft)	18	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Barium	27 - 27	100%	6.1	52	SB-311 (0 - 1 ft)	330	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Beryllium	27 - 27	100%	0.32	4.4	SB-321 (0 - 1 ft)	10	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Cadmium	26 - 27	96%	0.016 J	12.0	SB-BG-1 (0 - 1 ft)	0.36	**YES**	Max > ESV	0.14	Max>BTV	Site > Background	Not Consistent	NO	**YES**	**33.3**
Calcium	27 - 27	100%	216	26600	SB-311 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Chromium	27 - 27	100%	3.5	36.4	SB-BG-1 (0 - 1 ft)	0.4	**YES**	Max > ESV	11.8	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Cobalt	27 - 27	100%	1.3	7.6	SB-321 (0 - 1 ft)	2.4	**YES**	Max > ESV	5.9	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Copper	27 - 27	100%	3.0	116	SB-321 (0 - 1 ft)	28	**YES**	Max > ESV	17.0	Max>BTV	Site > Background	Not Consistent	NO	**YES**	**4.1**
Iron	27 - 27	100%	4240	14600	SB-316 (0 - 1 ft)	pH<5, pH>8	**YES**	No ESV	18278	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Lead	27 - 27	100%	7.1	383	SB-302 (0 - 1 ft)	11	**YES**	Max > ESV	35.0	Max>BTV	Site > Background	Not Consistent	NO	**YES**	**34.8**
Magnesium	27 - 27	100%	526	2080	SB-311 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Manganese	27 - 27	100%	54.6	248	SB-323 (0 - 1 ft)	220	**YES**	Max < ESV	219.2	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Mercury	21 - 27	78%	0.0092 J	2.1	SB-BG-1 (0 - 1 ft)	0.013	**YES**	Max > ESV	0.058	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Nickel	27 - 27	100%	2.7	67.7	SB-321 (0 - 1 ft)	38	**YES**	Max > ESV	11.1	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Potassium	27 - 27	100%	229	1160	SB-323 (0 - 1 ft)	NV	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Selenium	27 - 27	100%	0.08 J	0.46	SB-310 (0 - 1 ft)	0.52	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Silver	26 - 27	96%	0.021 J	11.5 J	SB-302 (0 - 1 ft)	4.2	**YES**	Max > ESV	0.181	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Sodium	20 - 27	74%	21.4 J	83.4	SB-321 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Thallium	27 - 27	100%	0.033 J	0.133	SB-323 (0 - 1 ft)	0.22	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Vanadium	27 - 27	100%	5.3	15.5	SB-319 (0 - 1 ft)	2	**YES**	Max > ESV	19.6	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Zinc	27 - 27	100%	26.5	425	SB-321 (0 - 1 ft)	46	**YES**	Max > ESV	50.13	Max>BTV	Site > Background	Not Consistent	NO	**YES**	**9.2**
Polychlorinated Biphenyls (PCBs) [c]															
Total PCB Aroclors	3 - 3	100%	0.23	0.48	ISM-BG1	0.020	**YES**	Max > ESV	NV	NE	NE	NA	NE	**YES**	**24.0**
Semi-Volatile Organic Compounds (SVOCs)															
1-Methylnaphthalene	14 - 27	52%	0.0022 J	0.041	SB-310 (0 - 1 ft)	0.14	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
2-Methylnaphthalene	20 - 27	74%	0.0024 J	0.071	SB-322 (0 - 1 ft)	0.11	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Acenaphthene	5 - 27	19%	0.0050 J	0.0355	SB-301 (0 - 1 ft)	0.25	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Anthracene	23 - 27	85%	0.0011 J	0.07	SB-301 (0 - 1 ft)	0.0015	**YES**	Max > ESV	0.0209	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Benzo(a)anthracene	24 - 27	89%	0.0032 J	0.4	SB-311 (0 - 1 ft)	1.1	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Benzo(a)Pyrene	26 - 27	96%	0.0038 J	0.5	SB-311 (0 - 1 ft)	1.1	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Benzo(b)fluoranthene	27 - 27	100%	0.0055 J	0.8	SB-311 (0 - 1 ft)	1.1	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Benzo(g,h,i)Perylene	25 - 27	93%	0.0056 J	0.36	SB-311 (0 - 1 ft)	1.1	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Benzo(k)Fluoranthene	26 - 27	96%	0.0044 J	0.27	SB-311 (0 - 1 ft)	1.1	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Chrysene	27 - 27	100%	0.0031 J	0.47	SB-311 (0 - 1 ft)	1.1	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Dibenzo(a,h)Anthracene	24 - 27	89%	0.0027 J	0.13	SB-311 (0 - 1 ft)	0.060	**YES**	Max > ESV	0.0299	Max>BTV	Site > Background	NA	NO	NO [g]	NCOPC
Fluoranthene	26 - 27	96%	0.0031 J	0.61 J	SB-305 (0 - 1 ft)	29	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Fluorene	11 - 27	41%	0.0034 J	0.035	SB-301 (0 - 1 ft)	30	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Indeno(1,2,3-CD)Pyrene	23 - 27	85%	0.0061 J	0.39	SB-311 (0 - 1 ft)	1.1	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Naphthalene	8 - 27	30%	0.0028 J	0.041	SB-310 (0 - 1 ft)	0.16	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Phenanthrene	27 - 27	100%	0.0022 J	0.37	SB-305 (0 - 1 ft)	29	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Pyrene	27 - 27	100%	0.0026 J	0.60	SB-311 (0 - 1 ft)	1.1	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Total HMW PAHs	27 - 27	100%	0.041	4.4	SB-311 (0 - 1 ft)	1.1	**YES**	Max > ESV	1.6	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Total LMW PAHs	27 - 27	100%	0.023	0.49	SB-301 (0 - 1 ft)	29	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Benzoic acid	1 - 26	4%	5.0 J	5.0 J	SB-301 (0 - 1 ft)	0.010	**YES**	Max > ESV	NV	NE	NE	NE	NE	**YES**	**500**
Bis-(2-Ethylhexyl)-Phthalate	4 - 27	15%	0.15 J	0.86	SB-BG-1 (0 - 1 ft)	0.020	**YES**	Max > ESV	NV	NE	NE	NE	NE	**YES**	**43.0**
Volatile Organic Compounds (VOCs)															
2-Butanone (MEK)	1 - 20	5%	0.0098 J	0.0098 J	SB-324 (0 - 1 ft)	1.0	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
4-Isopropyltoluene	4 - 20	20%	0.00068 J	0.0072 J	SB-320 (0 - 1 ft)	0.010	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Acetone	13 - 20	65%	0.0079 J	0.39 J	SB-324 (0 - 1 ft)	0.040	**YES**	Max > ESV	NV	NE	NE	NE	NE	**YES**	**9.8**
Carbon Disulfide	2 - 20	10%	0.00078 J	0.00086 J	SB-324 (0 - 1 ft)	0.005	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Toluene	11 - 20	55%	0.0013 J	0.0038 J	SB-311 (0 - 1 ft) SB-318 (0 - 1 ft)	0.010	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Trichloroethylene	4 - 20	20%	0.00065 J	0.0041 J	SB-307 (0 - 1 ft)	0.060	NO	Max < ESV	--	--	--	--	--	NO	NCOPC

Notes:

All results reported in milligrams per kilogram (mg/kg).
Gray shading indicates where chemical is eliminated as a COPC.
Orange shading identifies COPC with HQ > 1.
-- Not evaluated further (below ESV or consistent with background).
BTV - Background Threshold Value.
COPC - Chemical of Potential Concern.
EN - Essential Nutrient.
ESV - Ecological Screening Value.
ft - Feet.
HMW - High Molecular Weight.
HQ - Hazard Quotient (maximum detected concentration/ESV)
J - Analyte positively detected but value is an approximate concentration.
LMW - Low Molecular Weight.
NA - Not Applicable (does not apply to organic constituents).
NC - Not Calculated.
NCOPC - Not a COPC.
NE - Not Evaluated (background data not available).
NV - No Value.
PAH - Polycyclic Aromatic Hydrocarbon.

[a] Frequency of Detection: Total number of detects - Total number of samples.
[b] Ecological screening values are presented on Table 4-1.
[c] Total PCB results for the on-Project Blue Beach area are associated with soil samples collected from three sampling units (SUs) using an incremental sampling methodology (ISM). Summary statistics were calculated following resolution of triplicate ISM samples per SU with the SU-specific concentration equal to the 95 percent upper confidence limit (UCL) concentration (95% UCL) (calculated using the ISM calculator; Attachment C). The highest of the three SU-specific 95% UCLs, which is higher than the SU-specific maximum detected concentrations, is selected as a conservative concentration for purposes of COPC selection.
[d] Background Threshold Values are presented in Attachment D.
[e] Two-sample hypothesis test results comparing site and background data are presented in Attachment D.
[f] Geochmical evaluation is presented in Attachment D.
[g] Individual PAHs were not retained as COPCs. Due to the additive toxicity of PAHs, PAHs were only retained as COPCs based on the Total HMW or LMW PAH evaluations. Total HMW or LMW PAHs were not retained in this evaluation.

TABLE 4-5
SELECTION OF SURFACE SOIL COPCS - OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
NORTH KINGSTOWN, RHODE ISLAND
BLUE BEACH DISPOSAL AREA

						ESV Evaluation			Background Evaluation						
Detected Constituent	**Frequency of Detection [a]**	**Percent Detected**	**Minimum**	**Maximum**	**Location of Maximum Concentration**	**ESV for COPC Selection [b]**	**Preliminary COPC Based on ESV Comparison**	**Rationale**	**BTV [c]**	**BTV Comparision**	**Two-Sample Hypothesis [d]**	**Geochemical Analysis [e]**	**Consistent with Background?**	**COPC**	**Maximum HQ**
Inorganics															
Aluminum	10 - 10	100%	2660	6640	SB-329 (0 - 1 ft)	pH<5.5	**YES**	No ESV	13935	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Antimony	10 - 10	100%	0.029 J	0.158	SB-333 (0 - 1 ft)	0.27	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Arsenic	16 - 16	100%	0.99	4.2	SS-6A (0 - 1 ft) SS-3A (0 - 1 ft)	18	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Barium	16 - 16	100%	4.3	32.4	SB-331 (0 - 1 ft)	330	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Beryllium	10 - 10	100%	0.26	0.63	SB-332 (0 - 1 ft)	10	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Cadmium	12 - 16	75%	0.027 J	0.29	SB-333 (0 - 1 ft)	0.36	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Calcium	10 - 10	100%	335	1240	SB-330 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Chromium	16 - 16	100%	2.6	13.6	SB-329 (0 - 1 ft)	0.4	**YES**	Max > ESV	11.8	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Cobalt	10 - 10	100%	1.5	4.15	SB-329 (0 - 1 ft)	2.4	**YES**	Max > ESV	5.854	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Copper	10 - 10	100%	2.8	10.7	SB-329 (0 - 1 ft)	28	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Iron	10 - 10	100%	4480	10900	SB-329 (0 - 1 ft)	pH<5, pH>8	**YES**	No ESV	18278	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Lead	16 - 16	100%	9.0	37.8	SB-333 (0 - 1 ft)	11	**YES**	Max > ESV	35	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Magnesium	10 - 10	100%	500	4370	SB-329 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Manganese	10 - 10	100%	60.9	197	SB-331 (0 - 1 ft)	220	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Mercury	13 - 16	81%	0.0091 J	0.049	SS-1A (0 - 1 ft)	0.013	**YES**	Max > ESV	0.058	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Nickel	10 - 10	100%	2.3	22.5	SB-329 (0 - 1 ft)	38	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Potassium	10 - 10	100%	242	1660	SB-331 (0 - 1 ft)	NV	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Selenium	10 - 16	63%	0.072 J	0.20 J	SB-329 (0 - 1 ft)	0.52	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Silver	10 - 16	63%	0.022 J	0.18	SB-331 (0 - 1 ft)	4.2	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Thallium	4 - 10	40%	0.065 J	0.11	SB-331 (0 - 1 ft)	0.22	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Vanadium	10 - 10	100%	5.6	14.7	SB-332 (0 - 1 ft)	2	**YES**	Max > ESV	19.6	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Zinc	10 - 10	100%	15.4	92.3	SB-329 (0 - 1 ft)	46	**YES**	Max > ESV	50.13	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Polychlorinated Biphenyls (PCBs)															
Aroclor 1260	3 - 9	33%	0.056	0.19	SB-329 (0 - 1 ft)	0.020	**YES**	Max > ESV	NV	NE	NE	NA	NE	NO [f]	NCOPC
Total PCB Aroclors	3 - 9	33%	0.11	0.25	SB-329 (0 - 1 ft)	0.020	**YES**	Max > ESV	NV	NE	NE	NA	NE	**YES**	**12.5**
Semi-Volatile Organic Compounds (SVOCs)															
1-Methylnaphthalene	5 - 10	50%	0.0025 J	0.031	SB-330 (0 - 1 ft)	0.14	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
2-Methylnaphthalene	6 - 10	60%	0.0035 J	0.065	SB-330 (0 - 1 ft)	0.11	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Acenaphthene	2 - 10	20%	0.0070 J	0.013 J	SB-331 (0 - 1 ft)	0.25	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Acenaphthylene	3 - 10	30%	0.0098 J	0.10 J	SB-330 (0 - 1 ft)	0.34	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Anthracene	6 - 10	60%	0.0031 J	0.28 J	SB-330 (0 - 1 ft)	0.0015	**YES**	Max > ESV	0.0209	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Benzo(a)anthracene	10 - 10	100%	0.0046 J	2.1	SB-330 (0 - 1 ft)	1.1	**YES**	Max > ESV	0.234	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Benzo(a)Pyrene	10 - 10	100%	0.0073 J	2.1 J	SB-330 (0 - 1 ft)	1.1	**YES**	Max > ESV	0.225	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Benzo(b)fluoranthene	10 - 10	100%	0.0095 J	2.2	SB-330 (0 - 1 ft)	1.1	**YES**	Max > ESV	0.228	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Benzo(g,h,i)Perylene	10 - 10	100%	0.0076 J	1.2 J	SB-330 (0 - 1 ft)	1.1	**YES**	Max > ESV	0.157	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Benzo(k)Fluoranthene	10 - 10	100%	0.0051 J	0.73 J	SB-330 (0 - 1 ft)	1.1	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Chrysene	10 - 10	100%	0.0074 J	1.5	SB-330 (0 - 1 ft)	1.1	**YES**	Max > ESV	0.172	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Dibenzo(a,h)Anthracene	7 - 10	70%	0.0032 J	0.21 J	SB-330 (0 - 1 ft)	0.06	**YES**	Max > ESV	0.0299	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Fluoranthene	10 - 10	100%	0.0031 J	2.7 J	SB-330 (0 - 1 ft)	29	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Fluorene	3 - 10	30%	0.0049 J	0.059 J	SB-330 (0 - 1 ft)	30	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Indeno(1,2,3-CD)Pyrene	10 - 10	100%	0.0047 J	1.2 J	SB-330 (0 - 1 ft)	1.1	**YES**	Max > ESV	0.132	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Naphthalene	4 - 10	40%	0.013 J	0.0935	SB-330 (0 - 1 ft)	0.16	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Phenanthrene	10 - 10	100%	0.0021 J	0.85 J	SB-330 (0 - 1 ft)	29	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Pyrene	10 - 10	100%	0.0037 J	3.9 J	SB-330 (0 - 1 ft)	1.1	**YES**	Max > ESV	0.314	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Total HMW PAHs	10 - 10	100%	0.069	18.0	SB-330 (0 - 1 ft)	1.1	**YES**	Max > ESV	1.587	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Total LMW PAHs	10 - 10	100%	0.050	1.5	SB-330 (0 - 1 ft)	29	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Volatile Organic Compounds (VOCs)															
4-Isopropyltoluene	1 - 1	100%	0.0033 J	0.0033 J	SS-3A (0 - 1 ft)	0.010	NO	Max < ESV	--	--	--	--	--	NO	NCOPC

Notes:

All results reported in milligrams per kilogram (mg/kg).
Gray shading indicates where chemical is eliminated as a COPC.
Orange shading identifies COPC with HQ > 1.
-- Not evaluated further (below ESV or consistent with background).
BTV - Background Threshold Value.
COPC - Chemical of Potential Concern.
EN - Essential Nutrient.
ESV - Ecological Screening Value.
ft - Feet.
HMW - High Molecular Weight.
HQ - Hazard Quotient (maximum detected concentration/ESV)
J - Analyte positively detected but value is an approximate concentration.
LMW - Low Molecular Weight.
NA - Not Applicable (does not apply to organic constituents).
NC - Not Calculated.
NCOPC - Not a COPC.
NE - Not Evaluated (background data not available).
NV - No Value.
PAH - Polycyclic Aromatic Hydrocarbon.

[a] Frequency of Detection: Total number of detects - Total number of samples.
[b] Ecological screening values are presented on Table 4-1.
[c] Background Threshold Values are presented in Attachment D.
[d] Two-sample hypothesis test results comparing site and background data are presented in Attachment D.
[e] Geochmical evaluation is presented in Attachment D.
[f] Individual PCBs were not retained as COPCs. Due to the additive toxicity of PCBs, PCBs were only retained as COPCs based on the Total PCB evaluation. Total PCBs were retained as a COPC.

TABLE 4-6
SELECTION OF HYDRIC SOIL COPCS - OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

							ESV Evaluation			Background Evaluation Results						
Detected Constituent	**Frequency of Detection [a]**	**Percent Detected**	**Minimum**	**Maximum**	**Location of Maximum Concentration**	**ESV for COPC Selection [b]**	**Preliminary COPC Based on ESV Comparison**	**Rationale**	**BTV [c]**	**BTV Comparision**	**Two-Sample Hypothesis [d]**	**Geochemical Analysis [e]**	**Consistent with Background?**	**COPC**	**Maximum HQ**
Metals															
Aluminum	10 - 10	100%	4800	22000	SSH-301 (0 - 1 ft)	pH<5.5	**YES**	No ESV	10992	Max>BTV	Site > Background	Consistent with Background - NCOPC	YES	NO	NCOPC
Antimony	10 - 10	100%	0.099 J	1.16	SSH-303 (0 - 1 ft)	0.27	**YES**	Max > ESV	NV	NE	NE	NE	NE	**YES**	**4.3**
Arsenic	16 - 16	100%	2.37	16.3	SSH-309 (0 - 1 ft)	18	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Barium	16 - 16	100%	5.2	21.4	SSH-301 (0 - 1 ft)	330	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Beryllium	8 - 10	80%	0.434	1.19	SSH-301 (0 - 1 ft)	10	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Cadmium	14 - 16	88%	0.058 J	2.38	SSH-304 (0 - 1 ft)	0.36	**YES**	Max > ESV	NV	NE	NE	NE	NE	**YES**	**6.6**
Calcium	10 - 10	100%	1410	5230	SSH-302 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Chromium	16 - 16	100%	8.25	33.4	SSH-308 (0 - 1 ft)	0.4	**YES**	Max > ESV	14.6	Max>BTV	Site > Background	Consistent with Background - NCOPC	YES	NO	NCOPC
Cobalt	10 - 10	100%	1.54	8.51	SSH-304 (0 - 1 ft)	2.4	**YES**	Max > ESV	3.24	Max>BTV	Site > Background	Consistent with Background - NCOPC	YES	NO	NCOPC
Copper	10 - 10	100%	6.78	44	SSH-304 (0 - 1 ft)	28	**YES**	Max > ESV	10.7	Max>BTV	Site > Background	Not Consistent	NO	**YES**	**1.6**
Iron	10 - 10	100%	5050	22600	SSH-301 (0 - 1 ft)	pH<5, pH>8	**YES**	No ESV	13149	Max>BTV	Site > Background	Consistent with Background - NCOPC	YES	NO	NCOPC
Lead	16 - 16	100%	12.8	277	SSH-304 (0 - 1 ft)	11	**YES**	Max > ESV	59.9	Max>BTV	Site > Background	Not Consistent	NO	**YES**	**25.2**
Magnesium	10 - 10	100%	2150	8090	SSH-303 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Manganese	10 - 10	100%	64.9	205	SSH-301 (0 - 1 ft)	220	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Mercury	14 - 16	88%	0.044 J	0.21 J	SSH-302 (0 - 1 ft)	0.013	**YES**	Max > ESV	0.094	Max>BTV	Site > Background	Not Consistent	NO	**YES**	**16.2**
Nickel	10 - 10	100%	5.18	30.4	SSH-304 (0 - 1 ft)	38	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Potassium	10 - 10	100%	1040	2520	SSH-305 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Selenium	15 - 16	94%	0.19 J	4.9 J	SSH-6 (0 - 1 ft)	0.52	**YES**	Max > ESV	0.44	Max>BTV	Site > Background	Not Consistent	NO	**YES**	**9.4**
Silver	10 - 16	63%	0.038 J	0.481 J	SSH-303 (0 - 1 ft)	4.2	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Sodium	10 - 10	100%	6600	48000	SSH-303 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Thallium	7 - 10	70%	0.077 J	0.266	SSH-304 (0 - 1 ft)	0.22	**YES**	Max > ESV	NV	NE	NE	NE	NE	**YES**	**1.2**
Vanadium	10 - 10	100%	13.8	53.3	SSH-303 (0 - 1 ft)	2	**YES**	Max > ESV	24.5	Max>BTV	Site > Background	Consistent with Background - NCOPC	YES	NO	NCOPC
Zinc	10 - 10	100%	24.5	256	SSH-304 (0 - 1 ft)	46	**YES**	Max > ESV	43.2	Max>BTV	Site > Background	Consistent with Background - NCOPC	YES	NO	NCOPC
Polychlorinated Biphenyls (PCBs)															
Aroclor 1260	10 - 16	63%	0.039	0.36 J	SSH-301 (0 - 1 ft)	0.020	**YES**	Max > ESV	NV	NE	NE	NA	NE	NO [g]	NCOPC
Total PCB Aroclors	10 - 16	63%	0.13	2.3	SSH-4 (0 - 1 ft)	0.020	**YES**	Max > ESV	NV	NE	NE	NA	NE	**YES**	**115**
Semi-Volatile Organic Compounds (SVOCs)															
1-Methylnaphthalene	7 - 10	70%	0.0064 J	0.34 J	SSH-301 (0 - 1 ft)	0.14	**YES**	Max > ESV	NV	NE	NE	NA	NE	NO [f]	NCOPC
2-Methylnaphthalene	8 - 10	80%	0.0068 J	0.33 J	SSH-301 (0 - 1 ft)	0.11	**YES**	Max > ESV	NV	NE	NE	NA	NE	NO [f]	NCOPC
Acenaphthene	4 - 10	40%	0.013 J	0.047 J	SSH-301 (0 - 1 ft)	0.25	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Acenaphthylene	4 - 10	40%	0.013 J	0.0535 J	SSH-301 (0 - 1 ft)	0.34	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Anthracene	6 - 10	60%	0.0043 J	0.39	SSH-304 (0 - 1 ft)	0.0015	**YES**	Max > ESV	0.078	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Benzo(a)anthracene	8 - 10	80%	0.067	3.6	SSH-304 (0 - 1 ft)	1.1	**YES**	Max > ESV	0.59	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Benzo(a)Pyrene	10 - 10	100%	0.032 J	3	SSH-304 (0 - 1 ft)	1.1	**YES**	Max > ESV	0.7	Max>BTV	Site > Background	NA	NO	NO [f]	NCOPC
Benzo(b)fluoranthene	10 - 10	100%	0.065 J	4.3	SSH-304 (0 - 1 ft)	1.1	**YES**	Max > ESV	1.9	Max>BTV	Site > Background	NA	NO	NO [f]	NCOPC
Benzo(g,h,i)Perylene	9 - 10	90%	0.015 J	1.6	SSH-304 (0 - 1 ft)	1.1	**YES**	Max > ESV	0.56	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Benzo(k)Fluoranthene	10 - 10	100%	0.023 J	1.8	SSH-304 (0 - 1 ft)	1.1	**YES**	Max > ESV	0.55	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Chrysene	8 - 10	80%	0.1	3.9	SSH-304 (0 - 1 ft)	1.1	**YES**	Max > ESV	3.6	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Dibenzo(a,h)Anthracene	8 - 10	80%	0.017 J	0.49	SSH-304 (0 - 1 ft)	0.06	**YES**	Max > ESV	0.12	Max>BTV	Site > Background	NA	NO	NO [f]	NCOPC
Fluoranthene	9 - 10	90%	0.067	8.2	SSH-304 (0 - 1 ft)	29	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Fluorene	7 - 10	70%	0.016 J	0.22 J	SSH-301 (0 - 1 ft)	30	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Indeno(1,2,3-CD)Pyrene	9 - 10	90%	0.037 J	3.3	SSH-304 (0 - 1 ft)	1.1	**YES**	Max > ESV	1.1	Max>BTV	Site > Background	NA	NO	NO [f]	NCOPC
Naphthalene	7 - 10	70%	0.011 J	0.51 J	SSH-301 (0 - 1 ft)	0.16	**YES**	Max > ESV	0.024	Max>BTV	Site > Background	NA	NO	NO [f]	NCOPC
Phenanthrene	10 - 10	100%	0.03 J	2.9 J	SSH-301 (0 - 1 ft)	29	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Pyrene	10 - 10	100%	0.038 J	6.8	SSH-304 (0 - 1 ft)	1.1	**YES**	Max > ESV	2.7	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Total HMW PAHs	10 - 10	100%	0.34	37	SSH-304 (0 - 1 ft)	1.1	**YES**	Max > ESV	11.4	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Total Low MW PAHs	10 - 10	100%	0.06	4.4	SSH-301 (0 - 1 ft)	29	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
2,4-Dichlorophenol	8 - 10	80%	0.56	1.8	SSH-303 (0 - 1 ft)	0.010	**YES**	Max > ESV	NV	NE	NE	NA	NE	**YES**	**180**
Volatile Organic Compounds (VOCs)															
2-Butanone (MEK)	4 - 6	67%	0.0105 J	0.0925 J	SSH-6 (0 - 1 ft)	1.0	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Acetone	5 - 6	83%	0.119 J	4.29	SSH-6 (0 - 1 ft)	0.040	**YES**	Max > ESV	NV	NE	NE	NA	NE	**YES**	**107**
Carbon Disulfide	2 - 6	33%	0.0086 J	0.0186 J	SSH-3 (0 - 1 ft)	0.0050	**YES**	Max > ESV	NV	NE	NE	NA	NE	**YES**	**3.7**
Toluene	1 - 6	17%	0.0719	0.0719	SSH-6 (0 - 1 ft)	0.01	**YES**	Max > ESV	NV	NE	NE	NA	NE	**YES**	**7.2**

Notes:

All results reported in milligrams per kilogram (mg/kg).
Gray shading indicates where chemical is eliminated as a COPC.
Orange shading identifies COPC with HQ > 1.
-- Not evaluated further (below ESV or consistent with background).
BTV - Background Threshold Value.
COPC - Chemical of Potential Concern.
EN - Essential Nutrient.
ESV - Ecological Screening Value.
ft - Feet.
HMW - High Molecular Weight.
HQ - Hazard Quotient (maximum detected concentration/ESV)
J - Analyte positively detected but value is an approximate concentration.
LMW - Low Molecular Weight.
NA - Not Applicable (does not apply to organic constituents).
NC - Not Calculated.
NCOPC - Not a COPC.
NE - Not Evaluated (background data not available).
NV - No Value.
PAH - Polycyclic Aromatic Hydrocarbon.

[a] Frequency of Detection: Total number of detects - Total number of samples.
[b] Ecological screening values are presented on Table 4-1.
[c] Background Threshold Values are presented in Attachment D.
[d] Two-sample hypothesis test results comparing site and background data are presented in Attachment D.
[e] Geochmical evaluation is presented in Attachment D.
[f] Individual PAHs were not retained as COPCs. Due to the additive toxicity of PAHs, PAHs were only retained as COPCs based on the Total HMW or LMW PAH evaluations. Total HMW or LMW PAHs were not retained in this evaluation.
[g] Individual PCBs were not retained as COPCs. Due to the additive toxicity of PCBs, PCBs were only retained as COPCs based on the Total PCB evaluation. Total PCBs were retained as a COPC.

TABLE 4-7
SELECTION OF SEDIMENT COPCS - OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
NORTH KINGSTOWN, RHODE ISLAND
BLUE BEACH DISPOSAL AREA

							ESV Evaluation			Background Evaluation						
Detected Constituent	**Frequency of Detection [a]**	**Percent Detected**	**Minimum**	**Maximum**	**Location of Maximum Concentration**	**ESV for COPC Selection [b]**	**Preliminary COPC Based on ESV Comparison**	**Rationale**	**BTV [c]**	**BTV Comparision**	**Two-Sample Hypothesis [d]**	**Geochemical Analysis [e]**	**Consistent with Background?**	**COPC**	**Maximum HQ**
Inorganics															
Aluminum	15 - 15	100%	2100	20700	SED-336 (0 - 0.5 ft)	NV	**YES**	No ESV	11424	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Antimony	15 - 15	100%	0.021 J	1.1	SED-331 (0 - 0.5 ft)	2	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Arsenic	20 - 21	95%	0.59	26.4	SED-335 (0 - 0.5 ft)	7.24	**YES**	Max > ESV	7.1	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Barium	21 - 21	100%	1.5 J	120	SED-332 (0 - 0.5 ft)	48	**YES**	Max > ESV	36.1	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Beryllium	15 - 15	100%	0.215	1.65	SED-332 (0 - 0.5 ft)	NV	**YES**	No ESV	0.956	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Cadmium	16 - 21	76%	0.013 J	2.9	SED-332 (0 - 0.5 ft)	0.68	**YES**	Max > ESV	0.146	Max>BTV	Site > Background	Consistent with Background - NCOPC	YES	NO	NCOPC
Calcium	15 - 15	100%	310	6670	SED-331 (0 - 0.5 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Chromium	21 - 21	100%	2.3	44.4	SED-335 (0 - 0.5 ft)	43.4	**YES**	Max > ESV	16.5	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Cobalt	15 - 15	100%	1.01	31	SED-332 (0 - 0.5 ft)	10	**YES**	Max > ESV	4.4	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Copper	15 - 15	100%	3.54	75.3	SED-335 (0 - 0.5 ft)	18.7	**YES**	Max > ESV	22.5	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Iron	15 - 15	100%	4030	123000	SED-331 (0 - 0.5 ft)	NV	**YES**	No ESV	11127	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Lead	21 - 21	100%	4.6	584	SED-335 (0 - 0.5 ft)	30.2	**YES**	Max > ESV	76.1	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Magnesium	15 - 15	100%	894	7440	SED-336 (0 - 0.5 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Manganese	15 - 15	100%	43.2	2410	SED-332 (0 - 0.5 ft)	260	**YES**	Max < ESV	193	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Mercury	18 - 21	86%	0.011 J	0.289	SED-335 (0 - 0.5 ft)	0.13	**YES**	Max > ESV	0.0801	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Nickel	15 - 15	100%	2.62	33.2	SED-335 (0 - 0.5 ft)	15.9	**YES**	Max > ESV	11.44	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Potassium	15 - 15	100%	321	2900	SED-335 (0 - 0.5 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Selenium	16 - 21	76%	0.05 J	6.19	SED-332 (0 - 0.5 ft)	1	**YES**	Max > ESV	0.813	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Silver	15 - 21	71%	0.009 J	0.837	SED-335 (0 - 0.5 ft)	0.73	**YES**	Max > ESV	0.0881	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Sodium	10 - 15	67%	345 J	26100	SED-336 (0 - 0.5 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Thallium	15 - 15	100%	0.032 J	0.45 J	SED-332 (0 - 0.5 ft)	NV	**YES**	No ESV	0.172	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Vanadium	15 - 15	100%	4.5	70.5	SED-335 (0 - 0.5 ft)	57	**YES**	Max > ESV	21.0	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Zinc	15 - 15	100%	19	330	SED-332 (0 - 0.5 ft)	121	**YES**	Max > ESV	79.7	Max>BTV	Site > Background	Consistent with Background - NCOPC	YES	NO	NCOPC
Polychlorinated Biphenyls (PCBs)												--			
Aroclor 1260	10 - 18	56%	0.0174 J	1.3	SED-335 (0 - 0.5 ft)	0.04	**YES**	Max > ESV	NV	NE	NE	NA	NE	NO [g]	NCOPC
Total PCB Aroclors	10 - 18	56%	0.084	1.5	SED-335 (0 - 0.5 ft)	0.04	**YES**	Max > ESV	NV	NE	NE	NA	NE	**YES**	**37.5**
Semi-Volatile Organic Compounds (SVOCs)												--			
1-Methylnaphthalene	13 - 15	87%	0.0020 J	0.20	SED-334 (0 - 0.5 ft)	0.021	**YES**	Max > ESV	NV	NE	NE	NA	NE	NO [f]	NCOPC
2-Methylnaphthalene	12 - 15	80%	0.0044 J	0.24	SED-335 (0 - 0.5 ft)	0.0202	**YES**	Max > ESV	NV	NE	NE	NA	NE	NO [f]	NCOPC
Acenaphthene	7 - 15	47%	0.0056 J	0.041	SED-338 (0 - 0.5 ft)	0.0067	**YES**	Max > ESV	0.0588	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Acenaphthylene	8 - 15	53%	0.0041 J	0.046 J	SED-335 (0 - 0.5 ft)	0.00587	**YES**	Max > ESV	NV	NE	NE	NA	NE	NO [f]	NCOPC
Anthracene	14 - 15	93%	0.0047 J	0.35 J	SED-327 (0 - 0.5 ft)	0.0469	**YES**	Max > ESV	0.46	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Benzo(a)anthracene	15 - 15	100%	0.025	0.79	SED-328 (0 - 0.5 ft) SED-335 (0 - 0.5 ft)	0.0748	**YES**	Max > ESV	5.2	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Benzo(a)Pyrene	15 - 15	100%	0.048 J	1.7 J	SED-328 (0 - 0.5 ft)	0.0888	**YES**	Max > ESV	8.3	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Benzo(b)fluoranthene	15 - 15	100%	0.058	3.6	SED-328 (0 - 0.5 ft)	0.13	**YES**	Max > ESV	14.0	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Benzo(g,h,i)Perylene	15 - 15	100%	0.027	2	SED-328 (0 - 0.5 ft)	0.067	**YES**	Max > ESV	5.5	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Benzo(k)Fluoranthene	15 - 15	100%	0.019 J	1.2	SED-328 (0 - 0.5 ft)	0.07	**YES**	Max > ESV	5.1	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Chrysene	15 - 15	100%	0.059	2.2	SED-328 (0 - 0.5 ft)	0.0571	**YES**	Max > ESV	9.4	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Dibenzo(a,h)Anthracene	15 - 15	100%	0.0087 J	0.38	SED-328 (0 - 0.5 ft)	0.00622	**YES**	Max > ESV	1.2	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Fluoranthene	15 - 15	100%	0.048	3.4	SED-328 (0 - 0.5 ft)	0.111	**YES**	Max > ESV	16.6	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Fluorene	12 - 15	80%	0.0047 J	0.23	SED-335 (0 - 0.5 ft)	0.0212	**YES**	Max > ESV	0.123	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Indeno(1,2,3-CD)Pyrene	15 - 15	100%	0.031	3.2	SED-328 (0 - 0.5 ft)	0.017	**YES**	Max > ESV	7.5	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Naphthalene	10 - 15	67%	0.0072 J	0.37	SED-335 (0 - 0.5 ft)	0.0346	**YES**	Max > ESV	NV	NE	NE	NA	NE	NO [f]	NCOPC
Phenanthrene	15 - 15	100%	0.07	1.9	SED-335 (0 - 0.5 ft)	0.0867	**YES**	Max > ESV	5.0	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Pyrene	15 - 15	100%	0.086	2.1 J	SED-331 (0 - 0.5 ft) SED-335 (0 - 0.5 ft) SED-328 (0 - 0.5 ft)	0.053	**YES**	Max > ESV	14.84	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Total High MW PAHs	15 - 15	100%	0.41	21	SED-328 (0 - 0.5 ft)	0.19	**YES**	Max > ESV	85.1	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Total Low MW PAHs	15 - 15	100%	0.1	3.1	SED-335 (0 - 0.5 ft)	0.076	**YES**	Max > ESV	6.9	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Total PAHs	15 - 15	100%	0.55	22	SED-328 (0 - 0.5 ft)	1.61	**YES**	Max > ESV	91.9	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Bis-(2-Ethylhexyl)-Phthalate	5 - 15	33%	0.11 J	2.2 J	SED-335 (0 - 0.5 ft)	0.18	**YES**	Max > ESV	NV	NE	NE	NA	NE	**YES**	**12.2**
Carbazole	1 - 15	7%	0.22 J	0.22 J	SED-328 (0 - 0.5 ft)	0.021	**YES**	Max > ESV	1.0	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Volatile Organic Compounds (VOCs)												--			
2-Butanone (MEK)	5 - 6	83%	0.0083 J	0.0422 J	SED-104-2014 (0 - 0.5 ft)	NV	**YES**	No ESV	NV	NE	NE	NA	NE	**YES**	NC
Acetone	4 - 6	67%	0.061	0.283	SED-104-2014 (0 - 0.5 ft)	NV	**YES**	No ESV	NV	NE	NE	NA	NE	**YES**	NC
Carbon Disulfide	3 - 6	50%	0.0028 J	0.0134	SED 4 (0 - 0.5 ft)	0.000851	**YES**	Max < ESV	NV	NE	NE	NA	NE	**YES**	**15.7**
Isopropylbenzene	1 - 6	17%	0.003 J	0.003 J	SED 3 (0 - 0.5 ft)	0.086	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Naphthalene	3 - 6	50%	0.0013	0.0164	SED-104-2014 (0 - 0.5 ft)	0.0346	NO	Max < ESV	--	--	NE	NA	--	NO [f]	NCOPC
sec-Butylbenzene	1 - 6	17%	0.00875	0.00875	SED 3 (0 - 0.5 ft)	0.137	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
tert-Butylbenzene	1 - 6	17%	0.0052 J	0.0052 J	SED 3 (0 - 0.5 ft)	0.137	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Toluene	1 - 6	17%	0.004 J	0.004 J	SED 4 (0 - 0.5 ft)	1.09	NO	Max < ESV	--	--	--	--	--	NO	NCOPC

Notes:
All results reported in milligrams per kilogram (mg/kg).
Gray shading indicates where chemical is eliminated as a COPC.
Orange shading identifies COPC with HQ > 1.
-- Not evaluated further (below ESV or consistent with background).
BTV - Background Threshold Value.
COPC - Chemical of Potential Concern.
EN - Essential Nutrient.
ESV - Ecological Screening Value.
ft - Feet.
HMW - High Molecular Weight.
HQ - Hazard Quotient (maximum detected concentration/ESV)
J - Analyte positively detected but value is an approximate concentration.
LMW - Low Molecular Weight.
NA - Not Applicable (does not apply to organic constituents).
NC - Not Calculated.
NCOPC - Not a COPC.
NE - Not Evaluated (background data not available).
NV - No Value.
PAH - Polycyclic Aromatic Hydrocarbon.
[a] Frequency of Detection: Total number of detects - Total number of samples.
[b] Ecological screening values are presented on Table 4-2.
[c] Background Threshold Values are presented in Attachment D.
[d] Two-sample hypothesis test results comparing site and background data are presented in Attachment D.
[e] Geochemical evaluation is presented in Attachment D.
[f] Individual PAHs were not retained as COPCs. Due to the additive toxicity of PAHs, PAHs were only retained as COPCs based on the Total HMW or LMW PAH evaluations. Total HMW or LMW PAHs were not retained in this evaluation.
[g] Individual PCBs were not retained as COPCs. Due to the additive toxicity of PCBs, PCBs were only retained as COPCs based on the Total PCB evaluation. Total PCBs were retained as a COPC.

TABLE 4-8
SELECTION OF SEDIMENT COPCS - OFF-PROJECT NARRAGANSETT BAY AND BEACHFRONT AREA
ECOLOGICAL RISK ASSESSMENT
NORTH KINGSTOWN, RHODE ISLAND
BLUE BEACH DISPOSAL AREA

							ESV Evaluation			Background Evaluation						
Detected Constituent	**Frequency of Detection [a]**	**Percent Detected**	**Minimum**		**Maximum**		**Location of Maximum Concentration**	**ESV for COPC Selection [b]**	**Preliminary COPC Based on ESV Comparison**	**Rationale**	**BTV [c]**	**BTV Comparision**	**Two-Sample Hypothesis [d]**	**Geochemical Analysis [e]**	**Consistent with Background?**	**COPC**	**Maximum HQ**
Inorganics																	
Aluminum	10 - 10	100%	1620		10600		SED-305 (0 - 1 ft)	NV	**YES**	No ESV	10151	Max>BTV	Site <= Background	--	YES	NO	NCOPC
Antimony	9 - 10	90%	0.0175	J	0.054	J	SED-309 (0 - 1 ft)	2	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Arsenic	30 - 30	100%	0.93		3.2	J	Beach-5-A (0 - 0.5 ft)	7.24	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Barium	21 - 30	70%	1.8	J	8	J	Beach-8-A (0 - 0.5 ft)	48	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Beryllium	10 - 10	100%	0.18		1.58		SED-304 (0 - 1 ft)	NV	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Cadmium	10 - 30	33%	0.014	J	0.0909		SED-305 (0 - 1 ft)	0.68	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Calcium	10 - 10	100%	225		518	J	SED-305 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Chromium	30 - 30	100%	1.9	J	18.2		SED-OFF-9-090115 (0 - 0.5 ft)	52.3	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Cobalt	10 - 10	100%	1.02		3.92		SED-305 (0 - 1 ft)	10	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Copper	10 - 10	100%	2.49		14.1		SED-304 (0 - 1 ft)	18.7	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Iron	10 - 10	100%	3960		17200	J	SED-305 (0 - 1 ft)	NV	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Lead	30 - 30	100%	2.7	J	20.8		SED-303 (0 - 1 ft)	30.2	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Magnesium	10 - 10	100%	636		4390		SED-305 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Manganese	10 - 10	100%	46.6		233	J	SED-305 (0 - 1 ft)	260	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Mercury	2 - 30	7%	0.0053	J	0.0058	J	SED-302 (0 - 1 ft)	0.13	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Nickel	10 - 10	100%	2.61		8.1	J	SED-305 (0 - 1 ft)	15.9	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Potassium	10 - 10	100%	280		591	J	SED-301 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Selenium	3 - 30	10%	0.032	J	0.059	J	SED-305 (0 - 1 ft)	1	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Silver	10 - 30	33%	0.0073	J	0.014	J	SED-307 (0 - 1 ft)	0.73	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Sodium	10 - 10	100%	818		1340		SED-308 (0 - 1 ft)	NV	NO	EN	--	--	--	--	--	NO	NCOPC
Thallium	10 - 10	100%	0.022	J	0.035	J	SED-301 (0 - 1 ft) SED-303 (0 - 1 ft)	NV	**YES**	No ESV	0.219	Max<BTV - NCOPC	--	--	YES	NO	NCOPC
Vanadium	10 - 10	100%	3.0		10.3	J	SED-305 (0 - 1 ft)	57	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Zinc	10 - 10	100%	17.2		64		SED-304 (0 - 1 ft)	124	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Polychlorinated Biphenyls (PCBs)																	
Aroclor 1260	10 - 10	100%	0.016	J	0.025		SED-310 (0 - 1 ft)	0.04	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Total PCB Aroclors	10 - 10	100%	0.07		0.083		SED-310 (0 - 1 ft)	0.04	**YES**	Max > ESV	NV	NE	NE	NA	NE	**YES**	**2.1**
Volatile Organic Compounds (VOCs)																	
Acetone	8 - 20	40%	0.0074		0.0153		SED-OFF-6-083115 (0 - 0.5 ft)	NV	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Bromomethane	2 - 20	10%	0.0012	J	0.0015	J	Beach-6-A (0 - 0.5 ft)	NV	NO	Max < ESV	--	--	--	--	--	NO	NCOPC
Carbon Disulfide	11 - 20	55%	0.00083	J	0.0114		SED-OFF-1-083115 (0 - 0.5 ft)	0.000851	**YES**	Max > ESV	NV	NE	NE	NA	NE	**YES**	**13.4**
cis-1,2-Dichloroethene	1 - 20	5%	0.00029	J	0.00029	J	SED-OFF-5-083115 (0 - 0.5 ft)	NV	NO	Max < ESV	--	--	--	--	--	NO	NCOPC

Notes:

All results reported in milligrams per kilogram (mg/kg).
Gray shading indicates where chemical is eliminated as a COPC.
Orange shading identifies COPC with HQ > 1.
-- Not evaluated further (below ESV or consistent with background).
BTV - Background Threshold Value.
COPC - Chemical of Potential Concern.
EN - Essential Nutrient.
ESV - Ecological Screening Value.
ft - Feet.
HMW - High Molecular Weight.
HQ - Hazard Quotient (maximum detected concentration/ESV)
J - Analyte positively detected but value is an approximate concentration.
LMW - Low Molecular Weight.
NA - Not Applicable (does not apply to organic constituents).
NC - Not Calculated.
NCOPC - Not a COPC.
NE - Not Evaluated (background data not available).
NV - No Value.
PAH - Polycyclic Aromatic Hydrocarbon.

[a] Frequency of Detection: Total number of detects - Total number of samples.
[b] Ecological screening values are presented on Table 4-2.
[c] Background Threshold Values are presented in Attachment D.
[d] Two-sample hypothesis test results comparing site and background data are presented in Attachment D.
[e] Geochemical evaluation is presented in Attachment D. Evaluation not warranted for this exposure area.

TABLE 4-9
SELECTION OF SURFACE WATER COPCS - OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Detected Constituent	Frequency of Detection [a]	Percent Detected	Minimum	Maximum	Location of Maximum Concentration	ESV for COPC Selection [b]	COPC	Rationale	Maximum HQ
Inorganics - Dissolved									
Arsenic	1 - 7	14%	0.5 J	0.5 J	SW-1A (0.25 - 0.25 ft)	36	NO	Max < ESV	NCOPC
Barium	7 - 7	100%	4.1 J	16.2 J	SW-104-2014 (0.2 - 0.2 ft)	4.0	**YES**	Max > ESV	**4.1**
Cadmium	3 - 7	43%	0.05 J	0.06 J	SW-3A (0.5 - 0.5 ft)	1.1	NO	Max < ESV	NCOPC
Chromium	1 - 7	14%	2.3 J	2.3 J	SW-105-2014 (0.7 - 0.7 ft)	11	NO	Max < ESV	NCOPC
Lead	3 - 7	43%	0.50 J	1.2 J	SW-104-2014 (0.2 - 0.2 ft)	4.8	NO	Max < ESV	NCOPC
Inorganics - Total									
Barium	7 - 7	100%	4.2 J	13.5 J	SW-104-2014 (0.2 - 0.2 ft)	4.0	**YES**	Max > ESV	**3.4**
Cadmium	3 - 7	43%	0.03 J	0.06 J	SW-3A (0.5 - 0.5 ft)	1.1	NO	Max < ESV	NCOPC
Chromium	1 - 7	14%	2.4 J	2.4 J	SW-105-2014 (0.7 - 0.7 ft)	11	NO	Max < ESV	NCOPC
Lead	2 - 7	29%	0.60 J	1.6 J	SW-1A (0.25 - 0.25 ft)	4.8	NO	Max < ESV	NCOPC
Silver	1 - 7	14%	0.10 J	0.10 J	SW-103-2014 (0.5 - 0.5 ft)	0.23	NO	Max < ESV	NCOPC
Volatile Organic Compounds (VOCs)									
1,2,3-Trichlorobenzene	1 - 10	10%	0.12 J	0.12 J	SW-105-2014 (0.7 - 0.7 ft)	110	NO	Max < ESV	NCOPC
Acetone	1 - 10	10%	4.4 J	4.4 J	SW-105-2014 (0.7 - 0.7 ft)	1500	NO	Max < ESV	NCOPC
Carbon Disulfide	1 - 10	10%	2.6	2.6	SW-105-2014 (0.7 - 0.7 ft)	0.92	**YES**	Max > ESV	**2.8**
Naphthalene	1 - 10	10%	0.18 J	0.18 J	SW-105-2014 (0.7 - 0.7 ft)	1.1	NO	Max < ESV	NCOPC

Notes:
All results reported in micrograms per liter (ug/L)
Gray shading indicates where chemical is eliminated as a COPC.
Orange shading identifies COPC with HQ > 1.
COPC - Chemical of Potential Concern.
ESV - Ecological Screening Value.
ft - Feet.
HQ - Hazard Quotient (maximum detected concentration/ESV)
J - Analyte positively detected but value is an approximate concentration.
NCOPC - Not a COPC.

[a] Frequency of Detection: Total number of detects - Total number of samples.
[b] Ecological screening values are presented on Table 4-3.

TABLE 4-10
SELECTION OF POREWATER COPCS - OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Detected Constituent	Frequency of Detection [a]	Percent Detected	Minimum	Maximum	Location of Maximum Concentration	ESV for COPC Selection [b]	COPC	Rationale	Maximum HQ
Inorganics - Dissolved									
Arsenic	6 - 10	60%	2.2 J	12.6	PW-2-2014 (2.7 - 3 ft)	36	NO	Max < ESV	NCOPC
Barium	10 - 10	100%	8.3 J	67.9	PW-1-2014 (2.7 - 3 ft)	4.0	**YES**	Max > ESV	**17.0**
Cadmium	4 - 10	40%	0.040 J	0.24 J	PW-105 (0.75 - 1 ft)	1.1	NO	Max < ESV	NCOPC
Chromium	7 - 10	70%	2.1 J	4.5 J	PW-105 (0.75 - 1 ft)	11	NO	Max < ESV	NCOPC
Lead	1 - 10	10%	19.6	19.6	PW-3-2014 (2.7 - 3 ft)	4.8	**YES**	Max > ESV	**4.1**
Selenium	3 - 10	30%	2.7 J	14.2 J	PW-105 (0.75 - 1 ft)	71	NO	Max < ESV	NCOPC
Inorganics - Total									
Arsenic	7 - 10	70%	0.40 J	14.9	PW-2-2014 (2.7 - 3 ft)	36	NO	Max < ESV	NCOPC
Barium	10 - 10	100%	8.4 J	67.0	PW-1-2014 (2.7 - 3 ft)	4.0	**YES**	Max > ESV	**16.8**
Cadmium	2 - 10	20%	0.030 J	0.040 J	PW-1-2014 (2.7 - 3 ft)	1.1	NO	Max < ESV	NCOPC
Chromium	7 - 10	70%	1.6 J	4.8 J	PW-105 (0.75 - 1 ft)	11	NO	Max < ESV	NCOPC
Lead	1 - 10	10%	0.80 J	0.80 J	PW-2-2014 (2.7 - 3 ft)	4.8	NO	Max < ESV	NCOPC
Selenium	2 - 10	20%	4.9 J	9.4 J	PW-105 (0.75 - 1 ft)	71	NO	Max < ESV	NCOPC
Silver	1 - 10	10%	0.51 J	0.51 J	PW-104 (0.75 - 1 ft)	0.23	**YES**	Max > ESV	**2.2**
Volatile Organic Compounds (VOCs)									
1,1,2,2-Tetrachloroethane	1 - 23	4%	0.16 J	0.16 J	PW-5-2014 (2.7 - 3 ft)	90.2	NO	Max < ESV	NCOPC
1,1-Dichloroethene	1 - 23	4%	0.40 J	0.40 J	PW-1-2014 (2.7 - 3 ft)	25	NO	Max < ESV	NCOPC
Acetone	3 - 23	13%	4.3 J	5.2 J	PW-5-2014 (2.7 - 3 ft)	1500	NO	Max < ESV	NCOPC
Benzene	3 - 23	13%	0.13 J	0.25 J	PW-1-2014 (2.7 - 3 ft)	110	NO	Max < ESV	NCOPC
Carbon Disulfide	6 - 23	26%	0.20 J	1.1	PW-2-2014 (2.7 - 3 ft)	0.92	**YES**	Max > ESV	**1.2**
cis-1,2-Dichloroethene	3 - 23	13%	1.7	36.0	PW-1-2014 (2.7 - 3 ft)	970	NO	Max < ESV	NCOPC
Isopropylbenzene	1 - 23	4%	0.76	0.76	PW-H (2.7 - 3 ft)	2.6	NO	Max < ESV	NCOPC
O-Xylene	2 - 23	9%	0.080 J	0.10 J	PW-1-2014 (2.7 - 3 ft)	NV	NO	[c]	NCOPC
sec-Butylbenzene	2 - 23	9%	1.7	5.0	PW-I (2.7 - 3 ft)	110	NO	Max < ESV	NCOPC
tert-Butylbenzene	2 - 23	9%	0.81	4.5	PW-I (2.7 - 3 ft)	110	NO	Max < ESV	NCOPC
Toluene	1 - 23	4%	2.8	2.8	PW-I (2.7 - 3 ft)	2	**YES**	Max > ESV	**1.4**
Total Xylenes	2 - 23	9%	0.50	0.58	PW-1-2014 (2.7 - 3 ft)	19	NO	Max < ESV	NCOPC
trans-1,2-Dichloroethene	2 - 23	9%	1.3	1.4	PW-1-2014 (2.7 - 3 ft)	970	NO	Max < ESV	NCOPC
Trichloroethylene	4 - 23	17%	0.12 J	7.4	PW-H (2.7 - 3 ft)	21	NO	Max < ESV	NCOPC
Vinyl Chloride	2 - 23	9%	7.4	8.9	PW-1-2014 (2.7 - 3 ft)	930	NO	Max < ESV	NCOPC

Notes:
All results reported in micrograms per liter (ug/L)
Gray shading indicates where chemical is eliminated as a COPC.
Orange shading identifies COPC with HQ > 1.
COPC - Chemical of Potential Concern.
ESV - Ecological Screening Value.
ft - Feet.
HQ - Hazard Quotient (maximum detected concentration/ESV)
J - Analyte positively detected but value is an approximate concentration.
NCOPC - Not a COPC.
NV - No value.

[a] Frequency of Detection: Total number of detects - Total number of samples.
[b] Ecological screening values are presented on Table 4-3.
[c] o-xylene was not retained as a COPC because the maximum concentration of total xylenes was below the associated ESV.

TABLE 4-11
SELECTION OF POREWATER COPCS - OFF-PROJECT NARRAGANSETT BAY AND BEACHFRONT AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Detected Constituent	Frequency of Detection [a]	Percent Detected	Minimum	Maximum	Location of Maximum Concentration	ESV for COPC Selection [b]	COPC	Rationale	Maximum HQ
Inorganics - Dissolved									
Arsenic	4 - 20	20%	4.0 J	6.1 J	PW-ON-4-082715 (1 - 1.25 ft)	36	NO	Max < ESV	NCOPC
Barium	1 - 20	5%	29.1 J	29.1 J	PW-OFF-7-090115 (0.75 - 1 ft)	4.0	**YES**	Max > ESV	**7.3**
Selenium	3 - 20	15%	17.0 J	38.4 J	PW-ON-4-082715 (1 - 1.25 ft)	71	NO	Max < ESV	NCOPC
Inorganics - Total									
Arsenic	2 - 20	10%	4.3 J	4.6 J	PW-OFF-3-083115 (0.75 - 1 ft)	36	NO	Max < ESV	NCOPC
Barium	2 - 20	10%	32.9 J	33.9 J	PW-OFF-4-083115 (0.75 - 1 ft)	4.0	**YES**	Max > ESV	**8.5**
Chromium	1 - 20	5%	14.4 J	14.4 J	PW-OFF-4-083115 (0.75 - 1 ft)	50	NO	Max < ESV	NCOPC
Lead	2 - 20	10%	17.8 J	20.8 J	PW-OFF-9-090115 (0.75 - 1 ft)	5.6	**YES**	Max > ESV	**3.7**
Selenium	5 - 20	25%	20.1 J	30.4 J	PW-ON-6-082715 (1 - 1.25 ft)	71	NO	Max < ESV	NCOPC
Volatile Organic Compounds (VOCs)									
1,1-Dichloroethene	1 - 24	4%	9.7 J	9.7 J	PW-ON-9-082515 (1 - 1.25 ft)	2240	NO	Max < ESV	NCOPC
Benzene	1 - 24	4%	7.0 J	7.0 J	PW-ON-10-082515 (1 - 1.25 ft)	110	NO	Max < ESV	NCOPC

Notes:
All results reported in micrograms per liter (ug/L)
Gray shading indicates where chemical is eliminated as a COPC.
Orange shading identifies COPC with HQ > 1.
COPC - Chemical of Potential Concern.
ESV - Ecological Screening Value.
ft - Feet.
HQ - Hazard Quotient (maximum detected concentration/ESV)
J - Analyte positively detected but value is an approximate concentration.
NCOPC - Not a COPC.
NV - No value.

[a] Frequency of Detection: Total number of detects - Total number of samples.
[b] Ecological screening values are presented on Table 4-3.

TABLE 4-12
SUMMARY OF SCREENING LEVEL FOOD WEB HQs IN THE ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC	Maximum Soil Concentration (mg/kg_{dw})	Consistent with Background? [a]	NOAEL-based HQs - Maximum Concentrations					Retained as Food Web COPC for Further Evaluation?
			Bobwhite Quail	American Robin	Meadow Vole	Raccoon	Short-tailed Shrew	
Inorganics								
Arsenic	4.4	YES [b]	0.010	0.064	0.049	0.022	0.091	NO - all HQs < 1 and consistent with background
Cadmium	12.0	NO [c]	0.11	**6.1**	0.78	**1.3**	**10.1**	YES - HQ > 1 and not consistent with background
Chromium, Total	36.4	YES [b]	0.070	0.75	0.19	0.12	0.62	NO - all HQs < 1 and consistent with background
Copper	116	NO [c]	0.24	**2.5**	0.59	0.24	**1.4**	YES - HQ > 1 and not consistent with background
Lead	383	NO [c]	0.95	**11.1**	0.60	0.54	**2.8**	YES - HQ > 1 and not consistent with background
Mercury	2.1	YES [b]	**12.1**	**87.0**	**10.6**	**2.4**	**14.9**	NO - consistent with background [d]
Nickel	67.7	YES [b]	0.050	**1.7**	0.46	0.77	**5.5**	NO - consistent with background
Selenium	0.46	YES [b]	0.042	0.28	0.36	0.081	0.48	NO - all HQs < 1 and consistent with background
Silver	11.5	YES [b]	0.021	**1.8**	0.012	0.065	0.51	NO - consistent with background
Zinc	425	NO [c]	0.12	**1.5**	0.44	0.16	**1.1**	YES - HQ > 1 and not consistent with background
Organics								
Total HMW PAHs	4.4	YES [b]	0.025	0.87	0.30	0.32	**2.4**	NO - consistent with background
Total LMW PAHs	0.49	NE	0.0056	0.11	0.00071	0.00040	0.0030	NO - all HQs < 1
Total PCB Aroclors	0.48	NE	0.022	**2.7**	0.195	0.75	**6.1**	YES - HQ > 1 and background data not available

Notes:
Maximum EPCs for screening level evaluation represent maximum detected concentrations in surface soil from the on-project Blue Beach area. See Attachment G-1 for calculations.
Potential risk is calculated using the maximum detected concentrations and NOAEL-based TRVs.
HQs above 1 are bolded and highlighted.
COPCs were retained for the COPC refinement stage if HQs were above 1 and the COPC was not consistent with background.
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
HMW - High Molecular Weight.
HQ - Hazard Quotient (Dose/TRV).
LMW - Low Molecular Weight.
NE - Not Evaluated.
NOAEL - No Observed Adverse Effect Level.
PAHs - Polycyclic Aromatic Hydrocarbons.
PCBs - Polychlorinated Biphenyls.
TRV - Toxicity Reference Value.

[a] Maximum concentrations were considered relative to the background threshold values (BTVs) identified for surface soil (BTVs are provided in Attachment D). In addition, the on-project Blue Beach surface soil dataset was evaluated in hypothesis testing relative to the background surface soil dataset (Attachment D) and a geochemical evaluation was conducted to assess whether inorganics were consistent with background geochemical conditions (Attachment D). None of these soil COPCs were eliminated based on the geohemical evaluation.
[b] COPC was consistent with background based on either BTV comparison or population comparisons.
[c] COPC was not consistent with background based on BTV comparison and population comparisons and geochemical evaluation (as applicable).
[d] HQs for mercury are based on a maximum detected concentration that is 37 times higher than the remaining soil concentrations. HQs based on the second highest mercury concentration are only above 1 for the American robin (HQ = 2.3).

TABLE 4-13

SUMMARY OF SCREENING LEVEL FOOD WEB HQs IN THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA

ECOLOGICAL RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

COPC	Maximum Soil / Hydric Soil / Tidal Stream Sediment Concentration (mg/kg_{dw})	Consistent with Background? [a]	NOAEL-based HQs - Maximum Concentrations				Retained as Food Web COPC for Further Evaluation?
			Marsh Wren	Meadow Vole	Raccoon	Short-tailed Shrew	
Inorganics							
Arsenic	26.4	NO [e]	0.48	0.29	0.13	0.50	NO - all HQs < 1
Cadmium	2.9	NO [e]	0.32	0.35	0.060	0.30	NO - all HQs < 1
Chromium, Total	44.4	YES [c]	0.49	0.23	0.083	0.26	NO - all HQs < 1 and consistent with background
Copper	75.3	NO [e]	**7.8**	0.48	0.38	**2.7**	YES - HQ > 1 and not consistent with background
Lead	584	NO [e]	**7.7**	0.82	0.47	**1.3**	YES - HQ > 1 and not consistent with background
Mercury	0.29	NO [e]	**13.9**	**1.4**	0.25	**1.3**	YES - HQ > 1 and not consistent with background
Nickel	33.2	NO [e]	0.66	0.26	0.20	**1.3**	YES - HQ > 1 and not consistent with background
Selenium	6.2	NO [e]	**5.7**	**6.3**	**1.1**	**5.6**	YES - HQ > 1 and not consistent with background
Silver	0.84	NO [e]	0.23	0.00085	0.0047	0.037	NO - all HQs < 1
Zinc	330	YES [b]	**2.6**	0.38	0.16	**1.1**	NO - consistent with background
Organics							
Total HMW PAHs	37	YES [d]	0.097	0.69	0.18	0.15	NO - all HQs < 1 and consistent with background
Total LMW PAHs	4.4	NO [e]	0.016	0.0028	0.00031	0.00024	NO - all HQs < 1
Total PCB Aroclors	2.3	NE	**3.7**	0.93	0.67	**4.7**	YES - HQ > 1 and background data not available

Notes:

Maximum EPCs for screening level evaluation represent maximum detected concentrations among the following off-Project datasets: surface soil from the off-Project Red Maple Swamp walking path, hydric surface soil from the off-Project Red Maple Swamp, and surface sediment from the off-Project tidal stream. See Attachment E-2 for calculations.

Potential risk is calculated using the maximum detected concentrations and NOAEL-based TRVs.

HQs above 1 are bolded and highlighted.

COPCs were retained for the COPC refinement stage if HQs were above 1 and the COPC was not consistent with background.

COPC - Chemical of Potential Concern.

EPC - Exposure Point Concentration.

HMW - High Molecular Weight.

HQ - Hazard Quotient (Dose/TRV).

LMW - Low Molecular Weight.

NE - Not Evaluated.

NOAEL - No Observed Adverse Effect Level.

PAHs - Polycyclic Aromatic Hydrocarbons.

PCBs - Polychlorinated Biphenyls.

TRV - Toxicity Reference Value.

[a] Maximum concentrations were considered relative to the background threshold values (BTVs) identified for sediment, surface hydric soil, and surface soil (BTVs are provided in Attachment D) and media concentrations from each dataset were evaluated in hypothesis testing relative to the background surface soil dataset (Attachment D). A geochemical evaluation was also conducted to assess whether inorganics were consistent with background geochemical conditions (Attachment D). COPCs were only eliminated if they were consistent with BTVs or background in all three media.

[b] COPC was consistent with background based on population comparison for soil and based on geochemical evaluation for sediment and hydric soil.

[c] COPC was consistent with background based on population comparisons for soil and sediment and based on geochemical evaluation for hydric soil.

[d] COPC was consistent with background based on comparison to the sediment BTV and based on population comparisons for soil and hydric soil.

[e] COPC was not consistent with background based on BTV comparison, population comparison and geochemical evaluation (as applicable).

TABLE 4-14
SUMMARY OF SCREENING LEVEL COPCs PER MEDIA AND EXPOSURE AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ON-PROJECT BLUE BEACH AREA

ESV Comparisons

Surface Soil
- Antimony
- Cadmium
- Copper
- Lead
- Zinc
- Total PCB Aroclors
- Benzoic acid
- Bis-(2-Ethylhexyl)-Phthalate
- Acetone

Food Web Model

Surface Soil
- Cadmium
- Copper
- Lead
- Zinc
- Total PCB Aroclors

OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA

ESV Comparisons

Surface Soil	*Hydric Soil*	*Sediment*	*Surface Water*	*Porewater*
Total PCB Aroclors	Antimony	Total PCB Aroclors	Barium (dissolved & total)	Barium (dissolved & total)
	Cadmium	Bis-(2-Ethylhexyl)-Phthalate	Carbon Disulfide	Lead (dissolved)
	Copper	2-Butanone (MEK)		Silver (total)
	Lead	Acetone		Carbon Disulfide
	Mercury	Carbon Disulfide		Toluene
	Selenium			
	Thallium			
	Total PCB Aroclors			
	2,4-Dichlorophenol			
	Acetone			
	Carbon Disulfide			
	Toluene			

Food Web Model

Surface Soil, Hydric Soil, Sediment
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Total PCB Aroclors

OFF-PROJECT NARRAGANSETT BAY AND BEACHFRONT AREA

ESV Comparisons

Sediment	*Surface Water*	*Porewater*
Total PCB Aroclors	No COPCs	Barium (dissolved & total)
Carbon Disulfide		Lead (total)

Notes:
Chemicals of Potential Concern (COPCs) retained after comparisons to Ecological Screening Values (ESVs), screening level food web modeling, and consideration of background conditions.
Background evaluation includes comparisons to Background Threshold Values (BTVs), hypothesis testing, and geochemical analysis.

TABLE 4-15
COPC REFINEMENT - SURFACE SOIL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				EPCs Compared to Screening Level ESVs				EPCs Compared to Refined ESVs					
COPC [a]	**Frequency of Detection [b]**	**Percent Detected**	**Maximum EPC [c]**	**ESV - Plants [d]**	**Plant HQ**	**ESV - Soil Invertebrates [d]**	**Invertebrate HQ**	**Refined ESV - Plants [e]**	**HQ - Plants**	**Refined ESV - Soil Invertebrates [e]**	**HQ - Soil Invertebrates**	**Final COPC**
ON-PROJECT BLUE BEACH AREA												
Inorganics												
Antimony	27 - 27	100%	0.38 UCL	5	0.076	78	0.0049	58 LANL (plant)	0.0066	780 LANL (soil invert)	0.00049	NCOPC
Cadmium	26 - 27	96%	2.2 UCL	32	0.068	140	0.016	160 LANL (plant)	0.014	760 LANL (soil invert)	0.0029	NCOPC
Copper	27 - 27	100%	38.7 UCL	70	0.553	80	0.48	490 LANL (plant)	0.079	530 LANL (soil invert)	0.073	NCOPC
Lead	27 - 27	100%	106 UCL	120	0.884	1700	0.062	570 LANL (plant)	0.19	8400 LANL (soil invert)	0.013	NCOPC
Zinc	27 - 27	100%	140 UCL	160	0.876	120	**1.2**	810 LANL (plant)	0.17	930 LANL (soil invert)	0.15	NCOPC
Polychlorinated Biphenyls (PCBs) [f]												
Total PCB Aroclors	3 - 3	100%	0.31 UCL	40	0.0078	0.020	**15.5**	620 LANL (plant)	0.00050	0.676 USEPA R4 (sediment RSV)	0.46	NCOPC
Semi-Volatile Organic Compounds (SVOCs)												
Benzoic acid	1 - 26	4%	5.0 Maximum	NV	NC	0.010	**500**	NV	NC	2.0 USEPA R4 (sediment RSV)	**2.5**	NCOPC [h]
Bis-(2-Ethylhexyl)-Phthalate	4 - 27	15%	0.27 UCL	0.1	**2.7**	0.10	**2.7**	100 USEPA R4 (plant) [g]	0.0027	8.4 USEPA R4 (soil invert)	0.032	NCOPC
Volatile Organic Compounds (VOCs)												
Acetone	13 - 20	65%	0.12 UCL	NV	NC	0.040	**2.9**	NV	NC	38 USEPA R4 (sediment RSV)	0.0031	NCOPC
OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA												
Polychlorinated Biphenyls (PCBs)												
Total PCB Aroclors	3 - 9	33%	0.25 Maximum	40	0.0063	0.020	**12.5**	620 LANL (plant)	0.00040	0.68 USEPA R4 (sediment RSV)	0.37	NCOPC

Notes:
All results reported in milligrams per kilogram (mg/kg).
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
ESV - Ecological Screening Value.
HQ - Hazard Quotient (maximum EPC/ESV). Hazard quotients greater than 1 are in bold and highlighted.
NC - Not Calculated.
NCOPC - Not a COPC.
NV - No Value.
UCL - Upper Confidence Limit.

[a] Surface soil COPCs were identified in Table 4-4 (on-project) and Table 4-5 (off-project).
[b] Frequency of Detection: Total number of detects - Total number of samples.
[c] The maximum EPC is the recommended UCL, or the maximum detected concentration if a UCL could not be calculated (Attachment G-3).
[d] Screening level plant and invertebrate ESVs are identified in Table 4-1.
[e] Refined ESVs were selected in the following hierarchy:
[1] Los Alamos National Laboratory (LANL) Ecorisk Database (Release 4.1) low effect ecological screening level for plants or invertebrates in soil.
[2] USEPA Soil Screening Levels (Eco-SSLs) derived for plants or invertebrates.
[3] USEPA Region 4 ecological screening values for plants or invertebrates in soil (USEPA, 2018).
[4] USEPA Region 4 Refinement Screening Value (RSV) for invertebrates in sediment (USEPA, 2018) were used when other ESVs were not identified.
[f] Total PCB results for the on-Project Blue Beach area are associated with soil samples collected from three sampling units (SUs) using an incremental sampling methodology (ISM).
Summary statistics were calculated following resolution of triplicate ISM samples per SU with the SU-specific concentration equal to the 95 UCL concentration.
The maximum EPC represents the area-wide weighted mean concentration calculated based on the three SU-specific UCLs (see Attachment C).
[g] Value for diethylphthalate selected as a surrogate due to structural similarities.
[h] Eliminated as a COPC due to low frequency of detection ($\leq$ 5% with more than 20 samples).

TABLE 4-16
COPC REFINEMENT - SURFACE HYDRIC SOIL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

						EPCs Compared to Screening Level ESVs				EPCs Compared to Refined ESVs					
COPC [a]	**Frequency of Detection [b]**	**Percent Detected**	**Maximum EPC [c]**			**ESV - Plants [d]**	**Plant HQ**	**ESV - Soil Invertebrates [d]**	**Invertebrate HQ**	**Refined ESV - Plants [e]**		**HQ - Plants**	**Refined ESV - Soil Invertebrates [e]**		**HQ - Soil Invertebrates**	**Final COPC**
OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA																
Inorganics																
Antimony	10 - 10	100%	0.60	UCL		5	0.12	78	0.0076	58	LANL (plant)	0.010	780	LANL (soil invert)	0.00076	NCOPC
Cadmium	14 - 16	88%	0.91	UCL		32	0.028	140	0.0065	160	LANL (plant)	0.0057	760	LANL (soil invert)	0.0012	NCOPC
Copper	10 - 10	100%	30.3	UCL		70	0.433	80	0.38	490	LANL (plant)	0.062	530	LANL (soil invert)	0.057	NCOPC
Lead	16 - 16	100%	123	UCL		120	**1.0**	1700	0.073	570	LANL (plant)	0.22	8400	LANL (soil invert)	0.015	NCOPC
Mercury	14 - 16	88%	0.13	UCL		0.3	0.44	0.10	**1.3**	64	LANL (plant)	0.0021	1	LANL (soil invert)	0.26	NCOPC
Selenium	15 - 16	94%	2.8	UCL		0.52	**5.3**	4.1	0.67	3	LANL (plant)	0.92	41	LANL (soil invert)	0.067	NCOPC
Thallium	7 - 10	70%	0.17	UCL		1	0.17	1	0.17	0.5	LANL (plant)	0.35	NV	--	NC	NCOPC
Polychlorinated Biphenyls (PCBs)																
Total PCB Aroclors	10 - 16	63%	1.0	UCL		40	0.025	0.02	**50.4**	620	LANL (plant)	0.0016	0.676	USEPA R4 (sediment RSV)	**1.5**	**YES [g]**
Semi-Volatile Organic Compounds (SVOCs)																
2,4-Dichlorophenol	8 - 10	80%	1.2	UCL		0.01	**120**	0.01	**120**	8	LANL (plant) [e]	0.15	18	LANL (soil invert) [f]	0.066	NCOPC
Volatile Organic Compounds (VOCs)																
Acetone	5 - 6	83%	4.3	Maximum		NV	NC	0.04	**107**	NV		NC	38.1	USEPA R4 (sediment RSV)	0.11	NCOPC
Carbon Disulfide	2 - 6	33%	0.019	Maximum		NV	NC	0.005	**3.7**	NV		NC	1.6	USEPA R4 (sediment RSV)	0.012	NCOPC
Toluene	1 - 6	17%	0.072	Maximum		200	0.00036	0.01	**7.2**	200	USEPA R4 (plant)	0.00036	0.15	USEPA R4 (soil invertebrate)	0.48	NCOPC

Notes:
All results reported in milligrams per kilogram (mg/kg).
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
ESV - Ecological Screening Value.
HQ - Hazard Quotient (maximum EPC/ESV). Hazard quotients greater than 1 are in bold and highlighted.
NC - Not Calculated.
NCOPC - Not a COPC.
NV - No Value.
UCL - Upper Confidence Limit.

[a] Hydric soil COPCs were identified in Table 4-6.
[b] Frequency of Detection: Total number of detects - Total number of samples.
[c] The maximum EPC is the recommended UCL, or the maximum detected concentration if a UCL could not be calculated (Attachment G-3).
[d] Screening level plant and invertebrate ESVs are identified in Table 4-1.
[e] Refined ESVs were selected in the following hierarchy:
[1] Los Alamos National Laboratory (LANL) Ecorisk Database (Release 4.1) low effect ecological screening level for plants or invertebrates in soil.
[2] USEPA Soil Screening Levels (Eco-SSLs) derived for plants or invertebrates.
[3] USEPA Region 4 ecological screening values for plants or invertebrates in soil (USEPA, 2018).
[4] USEPA Region 4 Refinement Screening Value (RSV) for invertebrates in sediment (USEPA, 2018) were used when other ESVs were not identified.
[f] Value for phenol selected as a surrogate due to structural similarities.
[g] Further evaluation of PCBs in hydric soil is warranted for invertebrates (see Table 4-25).

TABLE 4-17
COPC REFINEMENT - SURFACE SEDIMENT
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				EPCs Compared to Screening Level ESVs		EPCs Compared to Refined ESVs			
COPC [a]	**Frequency of Detection [b]**	**Percent Detected**	**Maximum EPC [c]**	**Benthic Invertebrate ESV [d]**	**HQ**	**Refined ESV [e]**		**HQ**	**Final COPC**
OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA									
Polychlorinated Biphenyls (PCBs)									
Total PCB Aroclors	10 - 18	56%	0.44 UCL	0.040	**11.0**	0.18	Buchman (ERM)	**2.5**	**YES [f]**
Semi-Volatile Organic Compounds (SVOCs)									
Bis-(2-Ethylhexyl)-Phthalate	5 - 15	33%	1.0 UCL	0.18	**5.6**	2.6	Buchman (PEL)	0.38	NCOPC
Volatile Organic Compounds (VOCs)									
2-Butanone (MEK)	5 - 6	83%	0.032 UCL	NV	NC	22.7	USEPA R4 (RSV)	0.0014	NCOPC
Acetone	4 - 6	67%	0.20 UCL	NV	NC	38.1	USEPA R4 (RSV)	0.0052	NCOPC
Carbon Disulfide	3 - 6	50%	0.0134 Maximum	0.00085	**15.7**	1.6	USEPA R4 (RSV)	0.0085	NCOPC
OFF-PROJECT NARRAGANSETT BAY AND BEACHFRONT AREA									
Polychlorinated Biphenyls (PCBs)									
Total PCB Aroclors	10 - 10	100%	0.077 UCL	0.040	**1.9**	0.18	Buchman (ERM)	0.43	NCOPC
Volatile Organic Compounds (VOCs)									
Carbon Disulfide	11 - 20	55%	0.0055 UCL	0.00085	**6.5**	1.6	USEPA R4 (RSV)	0.0035	NCOPC

Notes:
All results reported in milligrams per kilogram (mg/kg).
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
ESV - Ecological Screening Value.
HQ - Hazard Quotient (maximum EPC/ESV). Hazard quotients greater than 1 are in bold and highlighted.
NCOPC - Not a COPC.
UCL - Upper Confidence Limit.

[a] Surface sediment COPCs were identified in Table 4-7 (off-Project Red Maple Swamp / Tidal Stream area) and Table 4-8 (off-Project Narragansett Bay and Beachfront area).
[b] Frequency of Detection: Total number of detects - Total number of samples.
[c] The maximum EPC is the recommended UCL, or the maximum detected concentration if a UCL could not be calculated (Attachment G-3).
[d] Screening level benthic invertebrate ESVs are identified in Table 4-2.
[e] Refined ESVs were selected in the following hierarchy:
[1] Lower of Probable Effect Concentration (freshwater PEC; MacDonald, et al., 2000) and Effects Range Median (marine ERM; Buchman, 2008).
[2] Probable Effect Level (PEL; Buchman, 2008).
[3] Region 4 Sediment Refinement Screening Value (RSV; USEPA, 2018).
[f] Further evaluation of PCBs in sediment is warranted for invertebrates (see Table 4-25).

TABLE 4-18
EVALUATION OF SEM, AVS, AND TOC DATA - OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

		Upgradient of Outfall 025 (Background/Reference Area)					Downgradient of Outfall 025				
Sample Location		**SED-321**	**SED-322**	**SED-323**	**SED-324**	**SED-325**	**SED-331**	**SED-333**	**SED-335**	**SED-337**	**SED-339**
Sample Date		**5/28/2020**	**5/28/2020**	**5/28/2020**	**5/28/2020**	**5/28/2020**	**5/28/2020**	**5/28/2020**	**5/28/2020**	**5/28/2020**	**5/28/2020**
Chemical	**Units**										
TOTAL ORGANIC CARBON	mg/kg	24001 J	50000	41001 J	41000	9401 J	440000 J	68000 J	190000 J	39001 J	10001 J
TOTAL ORGANIC CARBON	%	2.4	5.0	4.1	4.1	0.9	44.0	6.8	19.0	3.9	1.0
TOTAL ORGANIC CARBON	foc	0.024	0.050	0.041	0.041	0.0094	0.44	0.068	0.19	0.039	0.010
ACID VOLATILE SULFIDES	umol/g	0.061 J	< 0.13 U	< 0.13 U	< 0.12 U	< 0.095 U	< 0.097 U	1.8	3.2	1.8	0.072 J
CADMIUM	umol/g	0.00053 J	0.00032 J	0.00078 J	0.00039 J	0.000097 J	0.00012 J	0.0019 J	0.00094 J	0.00024 J	0.000051 J
COPPER	umol/g	0.15	0.11	0.11	0.043	0.013	0.0086 J	0.29	0.069	0.0070 J	0.026
LEAD	umol/g	0.14	0.11	0.091	0.024	0.020	0.015	0.68	0.26	0.010	0.016
NICKEL	umol/g	0.047	0.031	0.048	0.031	0.0024 J	0.0037 J	0.14	0.041	0.0030 J	0.011
SILVER	umol/g	0.00089 J	0.00052 J	0.00077 J	0.0013 J	< 0.00093 U	< 0.001 U	0.0032 J	0.00066 J	< 0.0011 U	< 0.00078 U
ZINC	umol/g	0.42	0.22	0.66	0.50	0.050	0.066	1.2	0.40	0.073	0.12
Sum SEM	umol/g	0.75	0.46	0.91	0.60	0.085	0.093	2.3	0.78	0.093	0.17
Sum SEM / AVS	unitless	**12.4**	NC	NC	NC	NC	NC	**1.3**	0.24	0.052	**2.4**
Sum SEM - AVS	umol/g	**0.69**	**0.46**	**0.91**	**0.60**	**0.085**	**0.093**	**0.49**	-2.4	-1.7	**0.1**
[Sum SEM - AVS]/foc	umol/g_{oc}	28.9	9.2	22.2	14.6	9.0	0.21	7.1	-12.8	-43.8	10.0

Notes:
Silver concentration is divided by 2 in the Sum SEM calculation (USEPA, 2005).
AVS - Acid Volatile Sulfides.
f_{oc} - fraction organic carbon.
J - Estimated concentration.
mg/kg - milligram/kilogram.
NC - Not calculated due to non-detect AVS value.
SEM - Simultaneously Extracted Metals.
U - Not detected. Valye treated as a zero in calculation.
umol/g - micromole per gram.
umol/g_{oc} - micromole per gram organic carbon.
Bold text indicates Sum SEM / AVS is greater than 1 or Sum SEM - AVS is greater than 0.
USEPA (2005) guidance on metals bioavailability evaluates possible binding of metals by both AVS and organic matter and provides the following scale to evaluate whether or not the organic carbon binding phase (represented as fraction organic carbon or foc), in conjunction with the AVS, is affecting the bioavailability of divalent metals in sediments:

If the $(\sum SEM-AVS)/f_{oc}$ excess exceeds 3000 µmol/g_{oc}, the sediments are presumed to be "likely to be toxic";

If the $(\sum SEM-AVS)/f_{oc}$ excess is between 130 and 3,000 µmol/g_{oc}, predictions of effects are uncertain; and

If the $(\sum SEM-AVS)/f_{oc}$ excess is less than 130 µmol/g_{oc}, the sediments are presumed to "not likely" be toxic.

TABLE 4-19
SUMMARY OF TOXICITY TESTING RESULTS - OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

28-Day Amphipod (L. plumulosus) test		Survival Endpoint	Growth Endpoints		Reproduction	
		Mean Percent Survival (%)	Mean Dry Weight (mg) [1]	Mean Biomass (mg) [2]	Mean Juveniles per Surviving Amphipod [3]	Mean Juveniles per Female [4]
Sample Location	**Location Group**	**Day 28**	**Day 28**	**Day 28**	**Day 28**	**Day 28**
Laboratory Control	Laboratory Control	91%	1.070	0.972	2.4	5.0
SED-321	Upstream Reference	73%	0.746	0.617 [a]	0.61 [a]	1.7 [a]
SED-322	Upstream Reference	73%	0.799	0.695 [a]	1.1 [a]	2.5 [a]
SED-323	Upstream Reference	74%	0.963 [a*]	0.707 [a]	0.93 [a]	1.6 [a]
SED-324	Upstream Reference	86%	0.924	0.840	1.3 [a]	3.3
SED-325	Upstream Reference	56% [a]	0.932	0.838	1.4	3.9
SED-331	Downstream Site	93%	0.749 [a]	0.696 [a, e*]	0.38 [a, c, e, f]	0.80 [a, c, e, f]
SED-333	Downstream Site	95%	0.973	0.940	1.9	3.6
SED-335	Downstream Site	61% [a, c*, d, e]	0.731 [a, f]	0.447 [a,c, d, e, f]	0.27 [a, c, d, e, f]	0.67 [a, b*, c, e, f]
SED-337	Downstream Site	96%	1.480	1.410	3.8	7.7
SED-339	Downstream Site	93%	0.672 [a, c*, d*, e, f]	0.626 [a, c*, e, f]	0.34 [a, c, d, e, f]	0.83 [a, c*, e, f]

Statististical results -
[a] Indicates a statistically significant reduction ($p<0.05$) in the response relative to the corresponding response in the laboratory control sample.
[b] Indicates a statistically significant reduction ($p<0.05$) in the response relative to the corresponding response in the reference sample from location SED-321.
[c] Indicates a statistically significant reduction ($p<0.05$) in the response relative to the corresponding response in the reference sample from location SED-322.
[d] Indicates a statistically significant reduction ($p<0.05$) in the response relative to the corresponding response in the reference sample from location SED-323.
[e] Indicates a statistically significant reduction ($p<0.05$) in the response relative to the corresponding response in the reference sample from location SED-324.
[f] Indicates a statistically significant reduction ($p<0.05$) in the response relative to the corresponding response in the reference sample from location SED-325.
[*] Indicates that a statistical outlier was identified and the finding of statistical significance varied depending on whether the outlier was excluded or not. The results presented in this table conservatively identify differences. See Attachment H for laboratory report.

1 - Mean dry weight (i.e., growth) is determined as mean dry weight divided by the number of organisms at test termination.
2 - Mean biomass is determined as mean dry weight divided by the number of organisms at test initiation.
3 - Juvenile production per surviving amphipod.
4 - Juvenile production per surviving female amphipod.

TABLE 4-20
SUMMARY OF MACROINVERTEBRATE COMMUNITY METRICS - OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Sample Location	Location Group	Collection Date	Total Richness [a]	Total Density [b]	Shannon Diversity (base e) [c]	Hilsenhoff Biotic Index [e]
SED-321	Upstream Reference	5/28/2020	18	439	2.29	7.7
SED-322	Upstream Reference	5/28/2020	10	343	0.78	9.4
SED-323	Upstream Reference	5/28/2020	10	113	1.02	5.9
SED-324	Upstream Reference	5/28/2020	9	42	1.70 [d]	6.2
SED-325	Upstream Reference	5/28/2020	4	10	1.09 [d]	8.2
SED-331	Downstream Site	5/28/2020	7	372	1.28	8.7
SED-333	Downstream Site	5/28/2020	13	121	2.02	7.2
SED-335	Downstream Site	5/28/2020	11	672	1.56	6.6
SED-337	Downstream Site	5/28/2020	4	84	0.82	9.8
SED-339	Downstream Site	5/28/2020	15	175	2.09	7.3

Notes:
Invertebrates identified and metrics calculated by Normandeau Associates, Inc. (see Attachment I) unless otherwise noted.
[a] Total number of taxa.
[b] Estimate of the total number of specimens in each sample based on the percentage of matrix processed
[c] Function of the number of species in a sample and the distribution of indiviuals.
[d] Matrices were processed in entirety but did not contain at least 80 specimens. Metrics were calculated by Normandeau Associates, Inc. bu not presented for use due to low number of specimens.
[e] Metric calculated by AECOM using individual counts and tolerance values identified by Normandeau Associates, Inc. Values range from 0 with higher values reflecting a more pollution tolerant invertebrate community.

TABLE 4-21
COPC REFINEMENT - SURFACE WATER
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				EPCs Compared to Screening Level ESVs		EPCs Compared to Refined ESVs			
COPC [a]	**Frequency of Detection [b]**	**Percent Detected**	**Maximum EPC [c]**	**Aquatic ESV [d]**	**HQ**	**Refined ESV [e]**		**HQ**	**Final COPC**
OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA									
Inorganics - Dissolved									
Barium	7 - 7	100%	13.6 UCL	4	**3.4**	110	USEPA R4 (marine)	0.12	NCOPC
Inorganics - Total									
Barium	7 - 7	100%	12.3 UCL	4	**3.1**	110	USEPA R4 (marine)	0.11	NCOPC
Volatile Organic Compounds (VOCs)									
Carbon Disulfide	1 - 10	10%	2.6 Maximum	0.92	**2.8**	130	USEPA R4 (freshwater)	0.020	NCOPC

Notes:
All results reported in micrograms per liter (ug/L)
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
ESV - Ecological Screening Value.
HQ - Hazard Quotient (maximum EPC/ESV). Hazard quotients greater than 1 are in bold and highlighted.
NCOPC - Not a COPC.
UCL - Upper Confidence Limit.

[a] Surface water COPCs were identified in Table 4-9.
[b] Frequency of Detection: Total number of detects - Total number of samples.
[c] The maximum EPC is the recommended UCL, or the maximum detected concentration if a UCL could not be calculated (Attachment G-3).
[d] Screening level aquatic ESVs are identified in Table 4-2.
[e] Refined ESVs were selected in the following hierarchy:
[1] Acute federal Ambient Water Quality Criteria (AWQC) (USEPA, 2020)
[2] USEPA Region 4 Acute Screening Value (USEPA, 2018)
For the Off-Project Red Maple Swamp/tidal marsh, the lower of available freshwater and marine ESVs were selected.

TABLE 4-22
COPC REFINEMENT - POREWATER
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				EPCs Compared to Screening Level ESVs		EPCs Compared to Refined ESVs		
Detected Constituent	**Frequency of Detection [a]**	**Percent Detected**	**Maximum EPC [c]**	**Aquatic ESV [d]**	**HQ**	**Refined ESV [e]**	**HQ**	**Final COPC**
OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA								
Inorganics - Dissolved								
Barium	10 - 10	100%	43.5 UCL	4	**10.9**	110 USEPA R4 (marine)	0.40	NCOPC
Lead	1 - 10	10%	19.6 Maximum	4.8 [f]	**4.1**	124 AWQC (freshwater) [f]	0.16	NCOPC
Inorganics - Total								
Barium	10 - 10	100%	43.1 UCL	4	**10.8**	110 USEPA R4 (marine)	0.39	NCOPC
Silver	1 - 10	10%	0.51 Maximum	0.23	**2.2**	1.9 AWQC (marine)	0.27	NCOPC
Volatile Organic Compounds (VOCs)								
Carbon Disulfide	6 - 23	26%	0.46 UCL	0.92	0.50	130 USEPA R4 (freshwater)	0.0035	NCOPC
Toluene	1 - 23	4%	2.8 Maximum	2	**1.4**	560 USEPA R4 (freshwater)	0.0050	NCOPC [g]
OFF-PROJECT NARRAGANSETT BAY AND BEACHFRONT AREA								
Inorganics - Dissolved								
Barium	1 - 20	5%	29.1 Maximum	4	**7.3**	110 USEPA R4 (marine)	0.26	NCOPC [g]
Inorganics - Total								
Barium	2 - 20	10%	33.9 Maximum	4	**8.5**	110 USEPA R4 (marine)	0.31	NCOPC
Lead	2 - 20	10%	20.8 Maximum	5.6	**3.7**	140 AWQC (marine)	0.15	NCOPC

Notes:
All results reported in micrograms per liter (ug/L)
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
ESV - Ecological Screening Value.
HQ - Hazard Quotient (maximum EPC/ESV). Hazard quotients greater than 1 are in bold and highlighted.
NCOPC - Not a COPC.
UCL - Upper Confidence Limit.

[a] Porewater COPCs were identified in Table 4-10 (off-project Red Maple Swamp / Tidal Stream area) and Table 4-11 (off-project Narragansett Bay and Beachfront area).
[b] Frequency of Detection: Total number of detects - Total number of samples.
[c] The maximum EPC is the recommended UCL, or the maximum detected concentration if a UCL could not be calculated (Attachment G-3).
[d] Screening level aquatic ESVs are identified in Table 4-2.
[e] Refined ESVs were selected in the following hierarchy:
[1] Acute federal Ambient Water Quality Criteria (AWQC) (USEPA, 2020);
[2] USEPA Region 4 Acute Screening Value (USEPA, 2018).
Marine surface water ESVs were preferentially selected for the Off-Project Narragansett Bay and Beach Front Area. If marine values were not available, then freshwater screening values were selected from the above hierarchy. For the Off-Project Red Maple Swamp/Tidal Stream Area, the lower of the freshwater and marine ESVs were selected.
[f] Value presented has been adjusted by a hardness of 183 mg/L, which is the average hardness for the Red Maple Swamp / tidal stream area.
[g] Eliminated as a COPC due to low frequency of detection ($\leq$ 5% with more than 20 samples).

TABLE 4-23
SUMMARY OF REFINED FOOD WEB HQs IN THE ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	NOAEL-based HQs - Maximum EPC		
COPC	**American Robin**	**Raccoon**	**Short-tailed Shrew**
Inorganics			
Cadmium	**1.6**	0.016	**2.6**
Copper	0.82	0.0044	0.47
Lead	**3.8**	0.0089	0.99
Zinc	0.99	0.0052	0.75
Organics			
Total PCB Aroclors	**1.7**	0.0092	**1.5**

	LOAEL-based HQs - Maximum EPC		
COPC	**American Robin**	**Raccoon**	**Short-tailed Shrew**
Inorganics			
Cadmium	0.36	0.0018	0.29
Copper	0.10	0.00030	0.032
Lead	0.14	0.00023	0.025
Zinc	0.38	0.0013	0.19
Organics			
Total PCB Aroclors	0.17	0.0024	0.40

Notes:
Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean.
PCB soil data are from incremental sampling and the EPC represents the area-wide weighted mean concentration calculated based on three sampling unit-specific UCLs.
Potential risk is calculated using the maximum EPC and both NOAEL-and LOAEL-based TRVs (Attachment G-4).
HQs above 1 are bolded and highlighted.

COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effect Level.
NOAEL - No Observed Adverse Effect Level.
PCBs - Polychlorinated Biphenyls.
TRV - Toxicity Reference Value.

TABLE 4-24

SUMMARY OF REFINED FOOD WEB HQs IN THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA

ECOLOGICAL RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

	NOAEL-based HQs - Maximum EPC			
COPC	**Marsh Wren**	**Meadow Vole**	**Raccoon**	**Short-tailed Shrew**
Inorganics				
Copper	**2.5**	0.30	0.00063	0.89
Lead	**1.2**	0.23	0.00039	0.21
Mercury	**4.5**	0.46	0.00039	0.44
Nickel	0.28	0.13	0.00043	0.53
Selenium	**1.4**	**1.3**	0.0012	**1.3**
Organics				
Total PCB Aroclors	**1.3**	0.32	0.00113	**1.6**

	LOAEL-based HQs - Maximum EPC			
COPC	**Marsh Wren**	**Meadow Vole**	**Raccoon**	**Short-tailed Shrew**
Inorganics				
Copper	0.29	0.020	0.000042	0.060
Lead	0.045	0.0057	0.000010	0.0053
Mercury	0.45	0.093	0.000078	0.088
Nickel	0.10	0.015	0.000049	0.061
Selenium	0.48	0.28	0.00025	0.29
Organics				
Total PCB Aroclors	0.13	0.032	0.00011	0.16

Notes:

Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean from the following off-Project datasets: surface soil from the off-Project Red Maple Swamp walking path, hydric surface soil from the off-Project Red Maple Swamp, and surface sediment from the off-Project tidal stream. See Attachment G-5 for calculations.

Potential risk is calculated using the maximum EPC and both NOAEL-and LOAEL-based TRVs.

HQs above 1 are bolded and highlighted.

COPC - Chemical of Potential Concern.

HQ - Hazard Quotient (Dose/TRV).

LMW - Low Molecular Weight.

NOAEL - No Observed Adverse Effect Level.

PCBs - Polychlorinated Biphenyls.

TRV - Toxicity Reference Value.

TABLE 4-25
SAMPLE-BY-SAMPLE EVALUTION OF PCB RESULTS IN SEDIMENT AND HYDRIC SOIL- OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Location	Sample Date	Total PCB Aroclors (mg/kg)		TOC (%)	Total PCB PEC-Q	Total PCB ERM-Q	10% Injury Benchmark (mg/kg) [a]	10% Injury Benchmark HQ
Sediment								
SED 3	11/30/2011	0.69	U	NA	1.0	**3.8**	4.7	0.15
SED-330	10/1/2019	0.084		NA	0.12	0.47	4.7	0.018
SED-331	10/2/2019	0.49	U	44	0.72	**2.7**	22.2	0.022
SED-336	10/2/2019	0.48		NA	0.71	**2.7**	4.7	0.10
SED-340	10/2/2019	0.12		NA	0.18	0.67	4.7	0.026
SED-332	10/2/2019	0.52	U	NA	0.77	**2.9**	4.7	0.11
SED-333	10/2/2019	0.16	U	6.8	0.24	0.89	3.4	0.047
SED-326	10/1/2019	0.072	U	NA	0.11	0.40	4.7	0.015
SED-327	10/1/2019	0.066	U	1.8	0.10	0.37	0.91	0.073
SED-337	10/2/2019	0.27		3.9	0.40	**1.5**	2.0	0.14
SED 4	11/29/2011	0.63		3.36	0.93	**3.5**	1.7	0.37
SED 5	11/29/2011	0.41		0.3	0.61	**2.3**	0.15	**2.7**
SED-334	10/2/2019	0.37		NA	0.55	**2.1**	4.7	0.079
SED-335	10/2/2019	1.5		19	**2.2**	**8.3**	9.6	0.16
SED-328	10/1/2019	0.39	U	NA	0.58	**2.2**	4.7	0.083
SED-329	10/1/2019	0.087	U	3.3	0.13	0.48	1.7	0.052
SED-338	10/2/2019	0.23		NA	0.34	**1.3**	4.7	0.049
SED-339	10/2/2019	0.1		1	0.15	0.56	0.50	0.20
Hydric Soil								
SSH-1	11/30/2011	1.1		4.67	**1.6**	**6.1**	2.4	0.47
SSH-2	11/29/2011	1.4		13.3	**2.1**	**7.8**	6.7	0.21
SSH-3	11/29/2011	1.5		19.3	**2.2**	**8.3**	9.7	0.15
SSH-310	10/4/2019	0.13		NA	0.19	0.72	9.6	0.014
SSH-301	10/4/2019	0.49		11	0.72	**2.7**	5.5	0.088
SSH-302	10/4/2019	0.58		NA	0.86	**3.2**	9.6	0.061
SSH-4	11/29/2011	2.3		23.9	**3.4**	**12.8**	12.1	0.19
SSH-306	10/4/2019	0.14	U	NA	0.21	0.78	9.6	0.015
SSH-5	11/29/2011	2.1	U	18.8	**3.1**	**11.7**	9.5	0.22
SSH-6	11/29/2011	1.6		15.6	**2.4**	**8.9**	7.9	0.20
SSH-307	10/4/2019	0.24		12	0.36	**1.3**	6.1	0.040
SSH-303	10/4/2019	0.46	U	29	0.68	**2.6**	14.6	0.031
SSH-308	10/4/2019	0.16	U	NA	0.24	0.89	9.6	0.017
SSH-309	10/4/2019	0.25	U	13	0.37	**1.4**	6.6	0.038
SSH-304	10/4/2019	0.15	U	NA	0.22	0.83	9.6	0.016
SSH-305	10/4/2019	0.38		28	0.56	**2.1**	14.1	0.027

Notes:

Shading indicates PEC-Q, ERM-Q, or HQ above 1.
ERM - Effects Range-Median (Buchman, 2008). ERM for Total PCBs in marine sediment is 0.18 mg/kg.
ERM-Q - ERM-quotient (concentration/ERM).
HQ - Hazard Quotient (maximum EPC/ESV). Hazard quotients greater than 1 are in bold and highlighted.
NA - Not Analyzed.
PEC - Probable Effect Concentration (PEC; MacDonald, et al., 2000). PEC for Total PCBs is 0.676 mg/kg.
PEC-Q - PEC-Quotient (concentration/PEC)
TOC - Total Organic Carbon.
U - Not detected at the specified limit.

[a] Sediment quality benchmark presented in Table 5 of Finkelstein, et al. (2017) is adjusted to reflect sample-specific TOC.
Average TOC is used used when sample-specific TOC is not available.

		Finkelstein, et al. (2017) Sediment Quality Benchmarks (mg/kg OC)	
		10% injury	20% injury
		50.43	89.0
	Average TOC (%)	Adjusted to mg/kg using site specific TOC	
Default	1	0.50	0.89
Sediment Average	9.3	4.7	8.3
Hydric Soil Average	19.0	9.6	16.9

mg/kg OC - milligram per kilogram organic carbon

TABLE 4-26
REFERENCE ENVELOPE COMPARISONS FOR SEDIMENT QUALITY TRIAD COMPONENTS - OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	Sediment Chemistry		Sediment Toxicity		Macroinvertebrate Community						
	Mean of Total PAHs, Total PCBs, and Mean Metals PEC-Qs	Mean of Total PAHs, Total PCBs, and Mean Metals ERM-Qs	Mean Biomass (mg)	Mean Juveniles per Surviving Amphipod	Total Richness	Total Density	Hilsenhoff Biotic Index	Summary of Responses			
Reference Envelope Value	**0.83**	**0.73**	**0.61**	**0.62**	**4**	**10**	**9.4**	**Sediment Contamination**	**Toxicity**	**Benthic Alteration**	**Interpretation of Responses**
SED-331	0.48	1.1	0.70	0.38	7	372	8.7	+	+	-	Toxic chemicals are stressing the system
SED-333	0.19	0.37	0.94	1.9	13	121	7.2	-	-	-	Strong evidence that there is no pollution induced degradation
SED-335	1.3	3.1	0.45	0.27	11	672	6.6	+	+	-	Toxic chemicals are stressing the system
SED-337	0.32	0.61	1.4	3.8	4	84	9.8	-	-	+	Alteration is not due to toxic chemicals
SED-339	0.077	0.20	0.63	0.34	15	175	7.3	-	+	-	Unmeasured chemicals or conditions exist with the potential to cause degradation.

Notes:
Shading indicates a response outside the reference envelope.
A result above the reference envelope is assigned a + (impacted) for these endpoints: mean PEC-Qs, mean ERM-Qs, and HBI.
A result below the reference envelope is assigned a + (impacted) for these endpoints: biomass and juveniles per amphipod endpoints from the toxicity tests, total richness, and total density.

PEC-Q - Probable Effect Concentration Quotient (freshwater benchmark evaluation).
ERM-Q - Effects Range Median Quotient (marine benchmark evaluation).

In the summary of responses for each triad component:
+ Indicates response was outside the reference envelope for at least one endpoint.
- Indicates response was within the reference envelope for all endpoints.
Interpretation of triad responses (Chapman, 1992).

Outcome Number	Sediment Contamination	Toxicity	Benthic Alteration	Possible Conclusions
1	+	+	+	Strong evidence for pollution-induced degradation
2	-	-	-	Strong evidence that there is no pollution induced degradation
3	+	-	-	Chemicals are not bioavailable
4	-	+	-	Unmeasured chemicals or conditions exist with the potential to cause degradation
5	-	-	+	Alteration is not due to toxic chemicals
6	+	+	-	Toxic chemicals are stressing the system
7	-	+	+	Unmeasured toxic chemicals are causing degradation
8	+	-	+	Chemicals are not bioavailable or alteration is not due to toxic chemicals

TABLE 4-27
SUMMARY OF STEP 3A HQs BY MEDIA AND EXPOSURE AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ON-PROJECT BLUE BEACH AREA

Refined ESV Comparisons

Surface Soil	Frequency of Detection [a]	Percent Detected	Maximum EPC [b] (mg/kg)		HQ - Plants	HQ - Soil Invertebrates	Final COPC
Antimony	27 - 27	100%	0.38	UCL	0.0066	0.00049	NCOPC
Cadmium	26 - 27	96%	2.2	UCL	0.014	0.0029	NCOPC
Copper	27 - 27	100%	39	UCL	0.079	0.073	NCOPC
Lead	27 - 27	100%	106	UCL	0.19	0.013	NCOPC
Zinc	27 - 27	100%	140	UCL	0.17	0.15	NCOPC
Total PCB Aroclors	3 - 3	100%	0.31	UCL	0.00050	0.46	NCOPC
Benzoic acid	1 - 26	4%	5.0	Maximum	NC	**2.5**	NCOPC [c]
Bis-(2-Ethylhexyl)-Phthalate	4 - 27	15%	0.27	UCL	0.0027	0.032	NCOPC
Acetone	13 - 20	65%	0.12	UCL	NC	0.0031	NCOPC

Refined Food Web Model	NOAEL-based HQs - Maximum EPC			LOAEL-based HQs - Maximum EPC		
Surface Soil	*American Robin*	*Raccoon*	*Short-tailed Shrew*	*American Robin*	*Raccoon*	*Short-tailed Shrew*
Cadmium	**1.6**	0.016	**2.6**	0.36	0.0018	0.29
Copper	0.82	0.004	0.47	0.10	0.00030	0.032
Lead	**3.8**	0.0089	0.99	0.14	0.00023	0.025
Zinc	0.99	0.0052	0.75	0.38	0.0013	0.19
Total PCB Aroclors	**1.7**	0.0092	**1.5**	0.17	0.0024	0.40

OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA

Refined ESV Comparisons

Surface Soil	Frequency of Detection [a]	Percent Detected	Maximum EPC [b] (mg/kg)		HQ - Plants	HQ - Soil Invertebrates	Final COPC
Total PCB Aroclors	3 - 9	33%	0.25	Maximum	0.00040	0.37	NCOPC

Hydric Soil	Frequency of Detection [a]	Percent Detected	Maximum EPC [b]		HQ - Plants	HQ - Soil Invertebrates	Final COPC
Antimony	10 - 10	100%	0.60	UCL	0.010	0.00076	NCOPC
Cadmium	14 - 16	88%	0.91	UCL	0.0057	0.0012	NCOPC
Copper	10 - 10	100%	30	UCL	0.062	0.057	NCOPC
Lead	16 - 16	100%	123	UCL	0.22	0.015	NCOPC
Mercury	14 - 16	88%	0.13	UCL	0.0021	0.26	NCOPC
Selenium	15 - 16	94%	2.8	UCL	0.92	0.067	NCOPC
Thallium	7 - 10	70%	0.17	UCL	0.35	NC	NCOPC
Total PCB Aroclors	10 - 16	63%	1.0	UCL	0.0016	**1.5**	NCOPC [d]
2,4-Dichlorophenol	8 - 10	80%	1.2	UCL	0.15	0.066	NCOPC
Acetone	5 - 6	83%	4.3	Maximum	NC	0.11	NCOPC
Carbon Disulfide	2 - 6	33%	0.019	Maximum	NC	0.012	NCOPC
Toluene	1 - 6	17%	0.072	Maximum	0.00036	0.48	NCOPC

Sediment	Frequency of Detection [a]	Percent Detected	Maximum EPC [b] (mg/kg)		HQ - Sediment Invertebrates	Final COPC
Total PCB Aroclors	10 - 18	56%	0.44	UCL	**2.5**	NCOPC [d]
Bis-(2-Ethylhexyl)-Phthalate	5 - 15	33%	1.01	UCL	0.38	NCOPC
2-Butanone (MEK)	5 - 6	83%	0.032	UCL	0.0014	NCOPC
Acetone	4 - 6	67%	0.20	UCL	0.0052	NCOPC
Carbon Disulfide	3 - 6	50%	0.013	Maximum	0.0085	NCOPC

Surface Water	Frequency of Detection [a]	Percent Detected	Maximum EPC [b] (ug/L)		HQ - Aquatic	Final COPC [e]
Barium - dissolved	7 - 7	100%	13.6	UCL	0.12	NCOPC
Barium - total	7 - 7	100%	12.3	UCL	0.11	NCOPC
Carbon Disulfide	1 - 10	10%	2.6	Maximum	0.020	NCOPC

Porewater	Frequency of Detection [a]	Percent Detected	Maximum EPC [b] (ug/L)		HQ - Aquatic	Final COPC [e]
Barium - dissolved	10 - 10	100%	43.5	UCL	0.40	NCOPC
Lead - dissolved	1 - 10	10%	19.6	Maximum	0.16	NCOPC
Barium - total	10 - 10	100%	43.1	UCL	0.39	NCOPC
Silver - total	1 - 10	10%	0.51	Maximum	0.27	NCOPC
Carbon Disulfide	6 - 23	26%	0.46	UCL	0.0035	NCOPC
Toluene	1 - 23	4%	2.8	Maximum	0.0050	NCOPC [c]

Refined Food Web Model	NOAEL-based HQs - Maximum EPC				LOAEL-based HQs - Maximum EPC			
Surface Soil, Hydric Soil, Sediment	*Marsh Wren*	*Meadow Vole*	*Raccoon*	*Short-tailed Shrew*	*Marsh Wren*	*Meadow Vole*	*Raccoon*	*Short-tailed Shrew*
Copper	**2.5**	0.30	0.00063	0.89	0.29	0.020	0.000042	0.060
Lead	**1.2**	0.23	0.00039	0.21	0.045	0.0057	0.000010	0.0053
Nickel	0.28	0.13	0.00043	0.53	0.10	0.015	0.000049	0.061
Selenium	**1.4**	**1.3**	0.00118	**1.3**	0.48	0.28	0.00025	0.29
Total PCB Aroclors	**1.3**	0.32	0.00113	**1.6**	0.13	0.032	0.00011	0.16

TABLE 4-27
SUMMARY OF STEP 3A HQs BY MEDIA AND EXPOSURE AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

OFF-PROJECT NARRAGANSETT BAY AND BEACHFRONT AREA

Refined ESV Comparisons

Sediment	Frequency of Detection [a]	Percent Detected	Maximum EPC [b] (mg/kg)	HQ - Sediment Invertebrates	Final COPC
Total PCB Aroclors	10 - 10	100%	0.0772 UCL	0.43	NCOPC
Carbon Disulfide	11 - 20	55%	0.0055 UCL	0.0035	NCOPC

Surface Water	Frequency of Detection [a]	Percent Detected	Maximum EPC [b] (ug/L)	HQ - Aquatic	Final COPC
No COPCs	-- - --	--	-- --	--	--

Porewater	Frequency of Detection [a]	Percent Detected	Maximum EPC [b] (ug/L)	HQ - Aquatic	Final COPC [e]
Barium - dissolved	1 - 20	5%	29 Maximum	0.26	NCOPC [c]
Barium - total	2 - 20	10%	34 Maximum	0.31	NCOPC
Lead - total	2 - 20	10%	21 Maximum	0.15	NCOPC

Notes:
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (EPC/ ESV or Dose/TRV).
LOAEL - Lowest Observed Adverse Effect Level.
NC - Not Calculated (ESV not available).
NCOPC - Not a COPC.
NOAEL - No Observed Adverse Effect Level.
PCBs - Polychlorinated Biphenyls.
TRV - Toxicity Reference Value.
UCL - Upper Confidence Limit.

Hazard Quotients calculated in refinement screening Tables 4-15, 4-16, 4-17, 4-21, and 4-22 and food webs summarized in Tables 4-23 and 4-24. Hazard quotients greater than 1 are in bold and highlighted.
[a] Frequency of Detection: Total number of detects - Total number of samples.
[b] The maximum EPC is the recommended UCL, or the maximum detected concentration if a UCL could not be calculated (Attachment C).
[c] Eliminated as a COPC due to low frequency of detection ≤ 5% with at least 20 samples).
[d] Eliminated as a COPC following sample-by-sample evaluation of PCBs in sediment and hydric soil in the off-Project Red Maple Swamp/tidal stream area (see Table 4-25).
[e] See discussion of surface water chronic ESVs and detected concentrations in Sections 4.6.4.2 and 4.6.4.3 for additional rationale for eliminating surface water and porewater COPCs from further evaluation.

Attachment A

Sample Lists and Analytical Data Summary Tables

ATTACHMENT A, TABLE A-1A
SOIL SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area (a)	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
SO	Background	SB-401	5/22/2020	SB-401-CI20-0-1	N		0 - 1 ft
SO	Background	SB-401	5/22/2020	SB-401-CI20-0-1-DUP	FD	SB-401-CI20-0-1	0 - 1 ft
SO	Background	SB-401	5/22/2020	SB-401-CI20-1-3	N		1 - 3 ft
SO	Background	SB-402	5/22/2020	SB-402-CI20-0-1	N		0 - 1 ft
SO	Background	SB-402	5/22/2020	SB-402-CI20-1-3	N		1 - 3 ft
SO	Background	SB-403	5/22/2020	SB-403-CI20-0-1	N		0 - 1 ft
SO	Background	SB-403	5/22/2020	SB-403-CI20-1-3	N		1 - 3 ft
SO	Background	SB-404	5/22/2020	SB-404-CI20-0-1	N		0 - 1 ft
SO	Background	SB-404	5/22/2020	SB-404-CI20-1-3	N		1 - 3 ft
SO	Background	SB-405	5/22/2020	SB-405-CI20-0-1	N		0 - 1 ft
SO	Background	SB-405	5/22/2020	SB-405-CI20-1-3	N		1 - 3 ft
SO	Background	SB-406	5/22/2020	SB-406-CI20-0-1	N		0 - 1 ft
SO	Background	SB-406	5/22/2020	SB-406-CI20-1-3	N		1 - 3 ft
SO	Background	SB-407	5/22/2020	SB-407-CI20-0-1	N		0 - 1 ft
SO	Background	SB-407	5/22/2020	SB-407-CI20-1-3	N		1 - 3 ft
SO	Background	SB-408	5/22/2020	SB-408-CI20-0-1	N		0 - 1 ft
SO	Background	SB-408	5/22/2020	SB-408-CI20-1-3	N		1 - 3 ft
SO	Background	SB-409	5/22/2020	SB-409-CI20-0-1	N		0 - 1 ft
SO	Background	SB-409	5/22/2020	SB-409-CI20-1-3	N		1 - 3 ft
SO	Background	SB-410	5/22/2020	SB-410-CI20-0-1	N		0 - 1 ft
SO	Background	SB-410	5/22/2020	SB-410-CI20-1-3	N		1 - 3 ft
SO	Background	SB-411	5/22/2020	SB-411-CI20-0-1	N		0 - 1 ft
SO	Background	SB-411	5/22/2020	SB-411-CI20-1-3	N		1 - 3 ft
SO	Background	SB-412	5/22/2020	SB-412-CI20-0-1	N		0 - 1 ft
SO	Background	SB-412	5/22/2020	SB-412-CI20-1-3	N		1 - 3 ft
SO	Background	SB-413	5/22/2020	SB-413-CI20-0-1	N		0 - 1 ft
SO	Background	SB-413	5/22/2020	SB-413-CI20-1-3	N		1 - 3 ft
SO	Background	SB-414	5/22/2020	SB-414-CI20-0-1	N		0 - 1 ft
SO	Background	SB-414	5/22/2020	SB-414-CI20-1-3	N		1 - 3 ft
SO	Background	SB-415	5/22/2020	SB-415-CI20-0-1	N		0 - 1 ft
SO	Background	SB-415	5/22/2020	SB-415-CI20-1-3	N		1 - 3 ft
SO	Background	SB-416	5/22/2020	SB-416-CI20-0-1	N		0 - 1 ft
SO	Background	SB-416	5/22/2020	SB-416-CI20-1-3	N		1 - 3 ft
SO	Background	SB-416	5/22/2020	SB-416-CI20-1-3-DUP	FD	SB-416-CI20-1-3	1 - 3 ft
SO	Background	SB-417	5/22/2020	SB-417-CI20-0-1	N		0 - 1 ft
SO	Background	SB-417	5/22/2020	SB-417-CI20-1-3	N		1 - 3 ft
SO	Background	SB-418	5/22/2020	SB-418-CI20-0-1	N		0 - 1 ft
SO	Background	SB-418	5/22/2020	SB-418-CI20-1-3	N		1 - 3 ft
SO	Background	SB-419	5/22/2020	SB-419-CI20-0-1	N		0 - 1 ft
SO	Background	SB-419	5/22/2020	SB-419-CI20-1-3	N		1 - 3 ft

ATTACHMENT A, TABLE A-1A
SOIL SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area (a)	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
SO	Background	SB-420	5/22/2020	SB-420-CI20-0-1	N		0 - 1 ft
SO	Background	SB-420	5/22/2020	SB-420-CI20-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	EA20VP	3/14/2006	EA20VP-031406	N		8 - 12 ft
SO	On-Project Blue Beach	EA27VP	3/14/2006	EA27VP-031406	N		8 - 12 ft
SO	On-Project Blue Beach	GP2-TR1B 6-6.5	11/17/2011	GP2-TR1B 6-6.5	N		6 - 6.5 ft
SO	On-Project Blue Beach	GP2-TR2A 6-7	11/17/2011	GP2-TR2A 6-7	N		6 - 7 ft
SO	On-Project Blue Beach	GP2-TR2D 6-7	11/17/2011	GP2-TR2D 6-7	N		6 - 7 ft
SO	On-Project Blue Beach	GP-TR1 5-7	11/16/2011	GP-TR1 5-7	N		5 - 7 ft
SO	On-Project Blue Beach	GP-TR2 6-8	11/16/2011	GP-TR2 6-8	N		6 - 8 ft
SO	On-Project Blue Beach	GP-TR3B 6-6.5	11/16/2011	GP-TR3B 6-6.5	N		6 - 6.5 ft
SO	On-Project Blue Beach	GP-TR3B 6-6.5	11/16/2011	GP-TR3B 6-6.5DUP	FD	GP-TR3B 6-6.5	6 - 6.5 ft
SO	On-Project Blue Beach	ISM-BG1	10/9/2019	ISM-BG1-1-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	ISM-BG1	10/9/2019	ISM-BG1-2-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	ISM-BG1	10/9/2019	ISM-BG1-3-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	ISM-BG1	10/10/2019	ISM-BG1-1-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	ISM-BG1	10/10/2019	ISM-BG1-2-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	ISM-BG1	10/10/2019	ISM-BG1-3-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	ISM-BG5	10/9/2019	ISM-BG5-1-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	ISM-BG5	10/9/2019	ISM-BG5-2-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	ISM-BG5	10/9/2019	ISM-BG5-3-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	ISM-BG5	10/10/2019	ISM-BG5-1-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	ISM-BG5	10/10/2019	ISM-BG5-2-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	ISM-BG5	10/10/2019	ISM-BG5-3-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	ISM-UPS	10/8/2019	ISM-UPS-1-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	ISM-UPS	10/8/2019	ISM-UPS-1-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	ISM-UPS	10/8/2019	ISM-UPS-2-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	ISM-UPS	10/8/2019	ISM-UPS-2-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	ISM-UPS	10/8/2019	ISM-UPS-3-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	ISM-UPS	10/8/2019	ISM-UPS-3-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-101	11/16/2011	SB-101A 0-4	N		0 - 4 ft
SO	On-Project Blue Beach	SB-101	11/16/2011	SB-101A 4-6	N		4 - 6 ft
SO	On-Project Blue Beach	SB-101	11/16/2011	SB-101A 4-6 DUP	FD	SB-101A 4-6	4 - 6 ft
SO	On-Project Blue Beach	SB-102	11/16/2011	SB-102A 5-7	N		5 - 7 ft
SO	On-Project Blue Beach	SB-103	11/16/2011	SB-103A 0-4	N		0 - 4 ft
SO	On-Project Blue Beach	SB-103	11/16/2011	SB-103A 4-6	N		4 - 6 ft
SO	On-Project Blue Beach	SB-103	11/16/2011	SB-103A 0-4 DUP	FD	SB-103A 0-4	0 - 4 ft
SO	On-Project Blue Beach	SB-104	11/16/2011	SB-104A 5-7	N		5 - 7 ft
SO	On-Project Blue Beach	SB-105	11/16/2011	SB-105A 8-10	N		8 - 10 ft
SO	On-Project Blue Beach	SB-105	11/16/2011	SB-105A 8-12	N		8 - 12 ft
SO	On-Project Blue Beach	SB-107	11/18/2011	SB107A 7-9	N		7 - 9 ft

ATTACHMENT A, TABLE A-1A
SOIL SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area (a)	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
SO	On-Project Blue Beach	SB-108	11/18/2011	SB-108A 0-4	N		0 - 4 ft
SO	On-Project Blue Beach	SB-108	11/18/2011	SB-108A 10-12	N		10 - 12 ft
SO	On-Project Blue Beach	SB-108	11/18/2011	SB-108A 10-14	N		10 - 14 ft
SO	On-Project Blue Beach	SB-108	11/18/2011	SB-108A 4-8	N		4 - 8 ft
SO	On-Project Blue Beach	SB-108	11/18/2011	SB-108A 8-12	N		8 - 12 ft
SO	On-Project Blue Beach	SB-108	11/18/2011	SB-108A 0-4 (2)	FD	SB-108A 0-4	0 - 4 ft
SO	On-Project Blue Beach	SB-301	10/9/2019	SB-301-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-301	10/9/2019	SB-301-CI19-0-1-DUP	FD	SB-301-CI19-0-1	0 - 1 ft
SO	On-Project Blue Beach	SB-301	10/9/2019	SB-301-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-301	10/9/2019	SB-301-CI19-1-3-DUP	FD	SB-301-CI19-1-3	1 - 3 ft
SO	On-Project Blue Beach	SB-302	10/9/2019	SB-302-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-302	10/9/2019	SB-302-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-303	10/9/2019	SB-303-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-303	10/9/2019	SB-303-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-304	10/9/2019	SB-304-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-304	10/9/2019	SB-304-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-305	10/9/2019	SB-305-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-305	10/9/2019	SB-305-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-306	10/9/2019	SB-306-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-306	10/9/2019	SB-306-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-307	10/7/2019	SB-307-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-307	10/7/2019	SB-307-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-308	10/7/2019	SB-308-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-308	10/7/2019	SB-308-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-309	10/7/2019	SB-309-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-309	10/7/2019	SB-309-CI19-0-1-DUP	FD	SB-309-CI19-0-1	0 - 1 ft
SO	On-Project Blue Beach	SB-309	10/7/2019	SB-309-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-310	10/7/2019	SB-310-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-310	10/7/2019	SB-310-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-311	10/7/2019	SB-311-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-311	10/7/2019	SB-311-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-312	10/7/2019	SB-312-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-312	10/7/2019	SB-312-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-313	10/7/2019	SB-313-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-313	10/7/2019	SB-313-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-314	10/7/2019	SB-314-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-314	10/7/2019	SB-314-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-315	10/7/2019	SB-315-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-315	10/7/2019	SB-315-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-316	10/7/2019	SB-316-CI19-0-1	N		0 - 1 ft

ATTACHMENT A, TABLE A-1A
SOIL SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area (a)	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
SO	On-Project Blue Beach	SB-316	10/7/2019	SB-316-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-317	10/7/2019	SB-317-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-317	10/7/2019	SB-317-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-318	10/7/2019	SB-318-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-318	10/7/2019	SB-318-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-319	10/7/2019	SB-319-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-319	10/7/2019	SB-319-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-320	10/7/2019	SB-320-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-320	10/7/2019	SB-320-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-321	10/7/2019	SB-321-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-321	10/7/2019	SB-321-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-322	10/7/2019	SB-322-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-322	10/7/2019	SB-322-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-323	10/7/2019	SB-323-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-323	10/7/2019	SB-323-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-324	10/7/2019	SB-324-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-324	10/7/2019	SB-324-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-325	10/7/2019	SB-325-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-325	10/7/2019	SB-325-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-326	10/7/2019	SB-326-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-326	10/7/2019	SB-326-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	SB-BG-1	10/9/2019	SB-BG-1-CI19-0-1	N		0 - 1 ft
SO	On-Project Blue Beach	SB-BG-1	10/9/2019	SB-BG-1-CI19-1-3	N		1 - 3 ft
SO	On-Project Blue Beach	UVF-18	11/22/2010	UVF-18_14.25-15.5	N		14.25 - 15.5 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	B-12-110502 (S-2)	11/5/2002	B-12-110502 (S-2)	N		2 - 4 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	CDW-1	11/5/2002	MW-11-110502 (S-3)	N		4 - 6 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	CDW-2	11/8/2002	MW-08-110502 (S-3)	N		6 - 8 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	CDW-3	11/5/2002	MW-07-110502 (S-6)	N		10 - 12 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	CDW-5	11/5/2002	MW-01-110502 (S-4)	N		6 - 8 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-106	11/21/2011	SB-106A 0-5	N		0 - 5 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-106	11/21/2011	SB-106A 3-5	N		3 - 5 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-201	9/18/2013	SB-201-A 8-10	N		8 - 10 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-202	9/18/2013	SB-202-A 13-15	N		13 - 15 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-202	9/18/2013	SB-202-A 8-10	N		8 - 10 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-203	9/18/2013	SB-203-A 8-10	N		8 - 10 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-204	9/18/2013	SB-204-A 8-10	N		8 - 10 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-205	9/18/2013	SB-205-A 7-9	N		7 - 9 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-206	9/18/2013	SB-206-A 8-10	N		8 - 10 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-207	9/18/2013	SB-207-A 8-10	N		8 - 10 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-208	9/18/2013	SB-208-A 8-10	N		8 - 10 ft

ATTACHMENT A, TABLE A-1A
SOIL SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area (a)	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-209	9/18/2013	SB-209-A 10-12	N		10 - 12 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-209	9/18/2013	SB-209-A 8-10	N		8 - 10 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-210	9/18/2013	SB-210-A 8-10	N		8 - 10 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-213	9/18/2013	SB-213-A 6-8	N		6 - 8 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-214	9/18/2013	SB-214-A 6-8	N		6 - 8 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-216	9/18/2013	SB-216-A 8-10	N		8 - 10 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-217	9/18/2013	SB-217-A 8-10	N		8 - 10 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-327	10/3/2019	SB-327-CI19-0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-328	10/3/2019	SB-328-CI19-0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-329	10/3/2019	SB-329-CI19-0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-330	10/3/2019	SB-330-CI19-0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-330	10/3/2019	SB-330-CI19-0-1-DUP	FD	SB-330-CI19-0-1	0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-331	10/3/2019	SB-331-CI19-0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-332	10/3/2019	SB-332-CI19-0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-333	10/3/2019	SB-333-CI19-0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-334	10/3/2019	SB-334-CI19-0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-335	10/3/2019	SB-335-CI19-0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SB-336	10/3/2019	SB-336-CI19-0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-1A	11/30/2011	SS-1A 0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-1A	11/30/2011	SS-1A 1-2	N		1 - 2 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-1A	11/30/2011	SS-1A 1-2DUP	FD	SS-1A 1-2	1 - 2 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-2A	11/30/2011	SS-2A 0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-2A	11/30/2011	SS-2A 1-2	N		1 - 2 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-3A	11/30/2011	SS-3A 0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-3A	11/30/2011	SS-3A 1-2	N		1 - 2 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-3A	11/30/2011	SS-3AD 1-2	FD	SS-3A 1-2	1 - 2 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-4A	11/30/2011	SS-4A 0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-4A	11/30/2011	SS-4A 1-2	N		1 - 2 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-5A	11/30/2011	SS-5A 0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-5A	11/30/2011	SS-5A 1-2	N		1 - 2 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-6A	11/30/2011	SS-6A 0-1	N		0 - 1 ft
SO	Off-Project Red Maple Swamp /Tidal Marsh	SS-6A	11/30/2011	SS-6A 1-2	N		1 - 2 ft

Notes:
FD - Field duplicate.
ft - Feet.
N - Normal sample.
SO - Soil.
(a) The Off-Project RedMaple Swamp/Tidal Marsh Area includes the adjacent public walking path from Circuit Drive to Blue Beach.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	EA20VP	EA27VP	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	EA20VP-031406	EA27VP-031406	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8
				Sample Date	3/14/2006	3/14/2006	11/17/2011	11/17/2011	11/17/2011	11/16/2011	11/16/2011
				Depth Interval	8 - 12 ft	8 - 12 ft	6 - 6.5 ft	6 - 7 ft	6 - 7 ft	5 - 7 ft	6 - 8 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_Metals	Aluminum	7429-90-5	mg/kg								
RA_SO_Metals	Antimony	7440-36-0	mg/kg								
RA_SO_Metals	Arsenic	7440-38-2	mg/kg			2.1 J	1.9 J	2.8		2.8	
RA_SO_Metals	Barium	7440-39-3	mg/kg			5.3	10.5	8		8.5	
RA_SO_Metals	Beryllium	7440-41-7	mg/kg								
RA_SO_Metals	Cadmium	7440-43-9	mg/kg			0.5 U	0.7	0.7		0.1 J	
RA_SO_Metals	Calcium	7440-70-2	mg/kg								
RA_SO_Metals	Chromium	7440-47-3	mg/kg			2.3	6	2.4		13.4	
RA_SO_Metals	Cobalt	7440-48-4	mg/kg								
RA_SO_Metals	Copper	7440-50-8	mg/kg								
RA_SO_Metals	Iron	7439-89-6	mg/kg								
RA_SO_Metals	Lead	7439-92-1	mg/kg			3.4 J	25.6	17.2		32.8	
RA_SO_Metals	Magnesium	7439-95-4	mg/kg								
RA_SO_Metals	Manganese	7439-96-5	mg/kg								
RA_SO_Metals	Mercury	7439-97-6	mg/kg			0.034 U	0.035 U	0.031 U		0.034 U	
RA_SO_Metals	Nickel	7440-02-0	mg/kg								
RA_SO_Metals	Potassium	7440-09-7	mg/kg								
RA_SO_Metals	Selenium	7782-49-2	mg/kg			4.5 U	4.6 U	5.1 U		4.5 U	
RA_SO_Metals	Silver	7440-22-4	mg/kg			0.5 U	0.5 U	0.5 U		0.4 U	
RA_SO_Metals	Sodium	7440-23-5	mg/kg								
RA_SO_Metals	Thallium	7440-28-0	mg/kg								
RA_SO_Metals	Vanadium	7440-62-2	mg/kg								
RA_SO_Metals	Zinc	7440-66-6	mg/kg								
RA_SO_Other	Total Organic Carbon	TOC	mg/kg								
RA_SO_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg								
RA_SO_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg								
RA_SO_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg								
RA_SO_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg								
RA_SO_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg								
RA_SO_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg								
RA_SO_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg								
RA_SO_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg								
RA_SO_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg								
RA_SO_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA_SO_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA_SO_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA_SO_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA_SO_SVOCs_EPHs	1-Methylnaphthalene	90-12-0	mg/kg								
RA_SO_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg								
RA_SO_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg								
RA_SO_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	mg/kg								
RA_SO_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	mg/kg								
RA_SO_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	mg/kg								
RA_SO_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg								
RA_SO_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg								
RA_SO_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	mg/kg								
RA_SO_SVOCs_EPHs	2-Chlorophenol	95-57-8	mg/kg								
RA_SO_SVOCs_EPHs	2-Methylnaphthalene	91-57-6	mg/kg								
RA_SO_SVOCs_EPHs	2-Methylphenol	95-48-7	mg/kg								
RA_SO_SVOCs_EPHs	2-Nitroaniline	88-74-4	mg/kg								
RA_SO_SVOCs_EPHs	2-Nitrophenol	88-75-5	mg/kg								
RA_SO_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg								
RA_SO_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg								
RA_SO_SVOCs_EPHs	3-Nitroaniline	99-09-2	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	EA20VP	EA27VP	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	EA20VP-031406	EA27VP-031406	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8
				Sample Date	3/14/2006	3/14/2006	11/17/2011	11/17/2011	11/17/2011	11/16/2011	11/16/2011
				Depth Interval	8 - 12 ft	8 - 12 ft	6 - 6.5 ft	6 - 7 ft	6 - 7 ft	5 - 7 ft	6 - 8 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg								
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg								
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg								
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg								
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg								
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg								
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg								
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg								
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg								
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg								
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg								
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg								
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg								
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg								
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg								
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg								
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg								
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg								
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg								
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg								
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg								
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg								
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg								
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg								
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg								
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg								
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg								
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg								
RA_SO_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg		0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0992 U	0.0882 U
RA_SO_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg		0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	EA20VP	EA27VP	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	EA20VP-031406	EA27VP-031406	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8
				Sample Date	3/14/2006	3/14/2006	11/17/2011	11/17/2011	11/17/2011	11/16/2011	11/16/2011
				Depth Interval	8 - 12 ft	8 - 12 ft	6 - 6.5 ft	6 - 7 ft	6 - 7 ft	5 - 7 ft	6 - 8 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.11 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0485
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg	0.42 U	0.003 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	63.3	14.2
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.297 U	0.265 U
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg	0.11 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	14.7	3.67
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg	0.11 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	1,4-Dioxane	123-91-1	mg/kg	11 U	0.068 U					
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0992 U	0.0882 U
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg	4.2 U	0.027 U	0.0431 U	0.0072 J	0.0409 U	0.198 U	2.79
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg	2.1 U	0.014 U	0.0431 U	0.0418 U	0.0409 U	0.198 U	0.176 U
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.75	0.172
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg	2.1 U	0.014 U	0.0431 U	0.0418 U	0.0409 U	0.496 U	358
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg	11 U	0.0068 U	0.0431 U	0.07	0.0409 U	0.198 U	2.28
RA_SO_VOCs_VPHs	Acrylonitrile	107-13-1	mg/kg	2.1 U	0.014 U					
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.475
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg	1.1 U	0.007 U	0.0086 U	0.0084 U	0.0082 U	0.0992 U	0.0882 U
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg							
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg							
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg							
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg	0.63 U	0.004 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg	2.1 U	0.014 U	0.0086 U	0.0084 U	0.0082 U	0.0992 U	0.0882 U
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg	0.42 U	0.003 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg	1.1 U	0.007 U	0.0086 U	0.0084 U	0.0082 U	0.0992 U	0.0882 U
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.114	0.153
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.11 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg	0.11 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg	2.1 U	0.014 U	0.0086 U	0.0084 U	0.0082 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Diethylether	60-29-7	mg/kg	2.1 U	0.014 U					
RA_SO_VOCs_VPHs	Diisopropyl Ether	108-20-3	mg/kg	0.11 U	0.001 U					
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg	0.21 U	0.001 U	0.0021 J	0.0023 J	0.0021 J	1.89	77.9
RA_SO_VOCs_VPHs	Freon 113	76-13-1	mg/kg	1.04 U	0.007 U					
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	1.07	0.715

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	EA20VP	EA27VP	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	EA20VP-031406	EA27VP-031406	GP2-TR1B 6-6.5	GP2-TR2A 6-7	GP2-TR2D 6-7	GP-TR1 5-7	GP-TR2 6-8
				Sample Date	3/14/2006	3/14/2006	11/17/2011	11/17/2011	11/17/2011	11/16/2011	11/16/2011
				Depth Interval	8 - 12 ft	8 - 12 ft	6 - 6.5 ft	6 - 7 ft	6 - 7 ft	5 - 7 ft	6 - 8 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	0.42 U	0.003 U	0.013	0.0138	0.0122	5.69	372
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg	2.1 U	0.014 U	0.0216 U	0.0209 U	0.0205 U	0.198 U	1.06
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.42 U	0.003 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg	1.1 U	0.007 U	4.3 U	4.2 U	4.1 U	0.0357 J	0.0749
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	9.05	2.04
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	0.21 U	0.001 U	0.0042 J	0.0033 J	0.0034 J	3.48	116
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	1.96	0.398
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg	0.11 U	0.001 U					
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg	4.2 U	0.027 U					
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg	0.11 U	0.001 U					
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.165	0.154
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg	1.1 U	0.007 U					
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.21 U	0.001 U	0.0025 J	0.0041 J	0.0025 J	0.33	433
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg							
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.63 U	0.0040 U	0.017	0.017	0.016	9.2	490
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.21 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.11 U	0.001 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg	0.42 U	0.007 U					
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg	0.21 U	0.001 U	0.0018 J	0.0034 J	0.0058	2.14	2.58
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg	1.1 U	0.007 U	0.0043 U	0.0042 U	0.0041 U	0.0496 U	0.0441 U
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg	1.1 U	0.007 U	0.0086 U	0.0084 U	0.0082 U	0.0496 U	0.0441 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	GP-TR3B 6-6.5	GP-TR3B 6-6.5	ISM-BG1	ISM-BG1	ISM-BG1	ISM-BG1	ISM-BG1
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	GP-TR3B 6-6.5	GP-TR3B 6-6.5DUP	ISM-BG1-1-CI19-1-3	ISM-BG1-2-CI19-1-3	ISM-BG1-3-CI19-1-3	ISM-BG1-1-CI19-0-1	ISM-BG1-2-CI19-0-1
				Sample Date	11/16/2011	11/16/2011	10/9/2019	10/9/2019	10/9/2019	10/10/2019	10/10/2019
				Depth Interval	6 - 6.5 ft	6 - 6.5 ft	1 - 3 ft	1 - 3 ft	1 - 3 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_Metals	Aluminum	7429-90-5	mg/kg								
RA_SO_Metals	Antimony	7440-36-0	mg/kg								
RA_SO_Metals	Arsenic	7440-38-2	mg/kg	3.1							
RA_SO_Metals	Barium	7440-39-3	mg/kg	9.1							
RA_SO_Metals	Beryllium	7440-41-7	mg/kg								
RA_SO_Metals	Cadmium	7440-43-9	mg/kg	0.2 J							
RA_SO_Metals	Calcium	7440-70-2	mg/kg								
RA_SO_Metals	Chromium	7440-47-3	mg/kg	6.9							
RA_SO_Metals	Cobalt	7440-48-4	mg/kg								
RA_SO_Metals	Copper	7440-50-8	mg/kg								
RA_SO_Metals	Iron	7439-89-6	mg/kg								
RA_SO_Metals	Lead	7439-92-1	mg/kg	21.6							
RA_SO_Metals	Magnesium	7439-95-4	mg/kg								
RA_SO_Metals	Manganese	7439-96-5	mg/kg								
RA_SO_Metals	Mercury	7439-97-6	mg/kg	0.033 U	0.032 U						
RA_SO_Metals	Nickel	7440-02-0	mg/kg								
RA_SO_Metals	Potassium	7440-09-7	mg/kg								
RA_SO_Metals	Selenium	7782-49-2	mg/kg	4.8 U							
RA_SO_Metals	Silver	7440-22-4	mg/kg	0.5 U							
RA_SO_Metals	Sodium	7440-23-5	mg/kg								
RA_SO_Metals	Thallium	7440-28-0	mg/kg								
RA_SO_Metals	Vanadium	7440-62-2	mg/kg								
RA_SO_Metals	Zinc	7440-66-6	mg/kg								
RA_SO_Other	Total Organic Carbon	TOC	mg/kg								
RA_SO_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg			0.0081 U	0.0084 U	0.008 U	0.0083 U	0.0079 U	
RA_SO_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg			0.0081 U	0.0084 U	0.008 U	0.0083 U	0.0079 U	
RA_SO_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg			0.0095 U	0.0098 U	0.0094 U	0.0098 U	0.0093 U	
RA_SO_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg			0.0081 U	0.0084 U	0.008 U	0.0083 U	0.0079 U	
RA_SO_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg			0.0081 U	0.0084 U	0.008 U	0.0083 U	0.0079 U	
RA_SO_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg			0.21	0.28	0.14	0.2	0.0590	
RA_SO_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg			0.13	0.0940	0.0820	0.17	0.12	
RA_SO_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg			0.33	0.37	0.22	0.37	0.18	
RA_SO_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg			0.38	0.42	0.26	0.41	0.22	
RA_SO_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA_SO_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA_SO_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA_SO_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA_SO_SVOCs_EPHs	1-Methylnaphthalene	90-12-0	mg/kg								
RA_SO_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg								
RA_SO_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg								
RA_SO_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	mg/kg								
RA_SO_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	mg/kg								
RA_SO_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	mg/kg								
RA_SO_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg								
RA_SO_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg								
RA_SO_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	mg/kg								
RA_SO_SVOCs_EPHs	2-Chlorophenol	95-57-8	mg/kg								
RA_SO_SVOCs_EPHs	2-Methylnaphthalene	91-57-6	mg/kg								
RA_SO_SVOCs_EPHs	2-Methylphenol	95-48-7	mg/kg								
RA_SO_SVOCs_EPHs	2-Nitroaniline	88-74-4	mg/kg								
RA_SO_SVOCs_EPHs	2-Nitrophenol	88-75-5	mg/kg								
RA_SO_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg								
RA_SO_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg								
RA_SO_SVOCs_EPHs	3-Nitroaniline	99-09-2	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	GP-TR3B 6-6.5	GP-TR3B 6-6.5	ISM-BG1	ISM-BG1	ISM-BG1	ISM-BG1	ISM-BG1
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	GP-TR3B 6-6.5	GP-TR3B 6-6.5DUP	ISM-BG1-1-CI19-1-3	ISM-BG1-2-CI19-1-3	ISM-BG1-3-CI19-1-3	ISM-BG1-1-CI19-0-1	ISM-BG1-2-CI19-0-1
				Sample Date	11/16/2011	11/16/2011	10/9/2019	10/9/2019	10/9/2019	10/10/2019	10/10/2019
				Depth Interval	6 - 6.5 ft	6 - 6.5 ft	1 - 3 ft	1 - 3 ft	1 - 3 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg								
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg								
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg								
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg								
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg								
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg								
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg								
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg								
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg								
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg								
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg								
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg								
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg								
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg								
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg								
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg								
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg								
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg								
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg								
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg								
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg								
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg								
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg								
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg								
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg								
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg								
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg								
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg								
RA_SO_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.102 U							
RA_SO_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0509 U							

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	GP-TR3B 6-6.5	GP-TR3B 6-6.5	ISM-BG1	ISM-BG1	ISM-BG1	ISM-BG1	ISM-BG1
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	GP-TR3B 6-6.5	GP-TR3B 6-6.5DUP	ISM-BG1-1-CI19-1-3	ISM-BG1-2-CI19-1-3	ISM-BG1-3-CI19-1-3	ISM-BG1-1-CI19-0-1	ISM-BG1-2-CI19-0-1
				Sample Date	11/16/2011	11/16/2011	10/9/2019	10/9/2019	10/9/2019	10/10/2019	10/10/2019
				Depth Interval	6 - 6.5 ft	6 - 6.5 ft	1 - 3 ft	1 - 3 ft	1 - 3 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	12.4							
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.306 U							
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	2.84							
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	1,4-Dioxane	123-91-1	mg/kg								
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg	0.102 U							
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg	0.204 U							
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg	0.204 U							
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg	0.145							
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.21 J							
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg	0.204 U							
RA_SO_VOCs_VPHs	Acrylonitrile	107-13-1	mg/kg								
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg	0.102 U							
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg								
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg								
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg								
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg	0.102 U							
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg	0.102 U							
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0866							
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Diethylether	60-29-7	mg/kg								
RA_SO_VOCs_VPHs	Diisopropyl Ether	108-20-3	mg/kg								
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg	0.321							
RA_SO_VOCs_VPHs	Freon 113	76-13-1	mg/kg								
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg	0.195							

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	GP-TR3B 6-6.5	GP-TR3B 6-6.5	ISM-BG1	ISM-BG1	ISM-BG1	ISM-BG1	ISM-BG1
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	GP-TR3B 6-6.5	GP-TR3B 6-6.5DUP	ISM-BG1-1-CI19-1-3	ISM-BG1-2-CI19-1-3	ISM-BG1-3-CI19-1-3	ISM-BG1-1-CI19-0-1	ISM-BG1-2-CI19-0-1
				Sample Date	11/16/2011	11/16/2011	10/9/2019	10/9/2019	10/9/2019	10/10/2019	10/10/2019
				Depth Interval	6 - 6.5 ft	6 - 6.5 ft	1 - 3 ft	1 - 3 ft	1 - 3 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	1.05							
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg	0.204 U							
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg	50.9 U							
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg	1.6							
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	0.644							
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg	0.378							
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg								
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg								
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg								
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg	0.0509 J							
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg								
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.131							
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg								
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	1.7							
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg								
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg	0.715							
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg	0.0509 U							
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg	0.0509 U							

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	ISM-BG1	ISM-BG5	ISM-BG5	ISM-BG5	ISM-BG5	ISM-BG5	ISM-BG5
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	ISM-BG1-3-CI19-0-1	ISM-BG5-1-CI19-1-3	ISM-BG5-2-CI19-1-3	ISM-BG5-3-CI19-1-3	ISM-BG5-1-CI19-0-1	ISM-BG5-2-CI19-0-1	ISM-BG5-3-CI19-0-1
				Sample Date	10/10/2019	10/9/2019	10/9/2019	10/9/2019	10/10/2019	10/10/2019	10/10/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	1 - 3 ft	1 - 3 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_Metals	Aluminum	7429-90-5	mg/kg								
RA_SO_Metals	Antimony	7440-36-0	mg/kg								
RA_SO_Metals	Arsenic	7440-38-2	mg/kg								
RA_SO_Metals	Barium	7440-39-3	mg/kg								
RA_SO_Metals	Beryllium	7440-41-7	mg/kg								
RA_SO_Metals	Cadmium	7440-43-9	mg/kg								
RA_SO_Metals	Calcium	7440-70-2	mg/kg								
RA_SO_Metals	Chromium	7440-47-3	mg/kg								
RA_SO_Metals	Cobalt	7440-48-4	mg/kg								
RA_SO_Metals	Copper	7440-50-8	mg/kg								
RA_SO_Metals	Iron	7439-89-6	mg/kg								
RA_SO_Metals	Lead	7439-92-1	mg/kg								
RA_SO_Metals	Magnesium	7439-95-4	mg/kg								
RA_SO_Metals	Manganese	7439-96-5	mg/kg								
RA_SO_Metals	Mercury	7439-97-6	mg/kg								
RA_SO_Metals	Nickel	7440-02-0	mg/kg								
RA_SO_Metals	Potassium	7440-09-7	mg/kg								
RA_SO_Metals	Selenium	7782-49-2	mg/kg								
RA_SO_Metals	Silver	7440-22-4	mg/kg								
RA_SO_Metals	Sodium	7440-23-5	mg/kg								
RA_SO_Metals	Thallium	7440-28-0	mg/kg								
RA_SO_Metals	Vanadium	7440-62-2	mg/kg								
RA_SO_Metals	Zinc	7440-66-6	mg/kg								
RA_SO_Other	Total Organic Carbon	TOC	mg/kg								
RA_SO_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.0082 U	0.0081 U	0.0085 UJ	0.008 U	0.0081 U	0.0084 U	0.0085 U	
RA_SO_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.0082 U	0.0081 U	0.0085 UJ	0.008 U	0.0081 U	0.0084 U	0.0085 U	
RA_SO_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.0097 U	0.0096 U	0.01 UJ	0.0094 U	0.0096 U	0.0098 U	0.01 U	
RA_SO_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.0082 U	0.0081 U	0.0085 UJ	0.008 U	0.0081 U	0.0084 U	0.0085 U	
RA_SO_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.0082 U	0.0081 U	0.0085 UJ	0.008 U	0.0081 U	0.0084 U	0.0085 U	
RA_SO_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.11	0.0081 U	0.0085 UJ	0.008 U	0.0081 U	0.0084 U	0.0630	
RA_SO_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.17	0.0290	0.0240 J	0.0120 J	0.0700	0.12	0.0910	
RA_SO_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.28	0.0290 J	0.0240 J	0.0120 J	0.0700 J	0.12	0.154	
RA_SO_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.32	0.079	0.077	0.061	0.12	0.17	0.20	
RA_SO_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA_SO_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA_SO_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA_SO_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA_SO_SVOCs_EPHs	1-Methylnaphthalene	90-12-0	mg/kg								
RA_SO_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg								
RA_SO_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg								
RA_SO_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	mg/kg								
RA_SO_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	mg/kg								
RA_SO_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	mg/kg								
RA_SO_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg								
RA_SO_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg								
RA_SO_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	mg/kg								
RA_SO_SVOCs_EPHs	2-Chlorophenol	95-57-8	mg/kg								
RA_SO_SVOCs_EPHs	2-Methylnaphthalene	91-57-6	mg/kg								
RA_SO_SVOCs_EPHs	2-Methylphenol	95-48-7	mg/kg								
RA_SO_SVOCs_EPHs	2-Nitroaniline	88-74-4	mg/kg								
RA_SO_SVOCs_EPHs	2-Nitrophenol	88-75-5	mg/kg								
RA_SO_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg								
RA_SO_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg								
RA_SO_SVOCs_EPHs	3-Nitroaniline	99-09-2	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	ISM-BG1	ISM-BG5	ISM-BG5	ISM-BG5	ISM-BG5	ISM-BG5	ISM-BG5
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	ISM-BG1-3-CI19-0-1	ISM-BG5-1-CI19-1-3	ISM-BG5-2-CI19-1-3	ISM-BG5-3-CI19-1-3	ISM-BG5-1-CI19-0-1	ISM-BG5-2-CI19-0-1	ISM-BG5-3-CI19-0-1
				Sample Date	10/10/2019	10/9/2019	10/9/2019	10/9/2019	10/10/2019	10/10/2019	10/10/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	1 - 3 ft	1 - 3 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg								
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg								
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg								
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg								
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg								
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg								
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg								
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg								
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg								
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg								
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg								
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg								
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg								
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg								
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg								
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg								
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg								
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg								
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg								
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg								
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg								
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg								
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg								
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg								
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg								
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg								
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg								
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg								
RA_SO_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg								
RA_SO_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	ISM-BG1	ISM-BG5	ISM-BG5	ISM-BG5	ISM-BG5	ISM-BG5	ISM-BG5
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	ISM-BG1-3-CI19-0-1	ISM-BG5-1-CI19-1-3	ISM-BG5-2-CI19-1-3	ISM-BG5-3-CI19-1-3	ISM-BG5-1-CI19-0-1	ISM-BG5-2-CI19-0-1	ISM-BG5-3-CI19-0-1
				Sample Date	10/10/2019	10/9/2019	10/9/2019	10/9/2019	10/10/2019	10/10/2019	10/10/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	1 - 3 ft	1 - 3 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg								
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg								
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg								
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg								
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg								
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg								
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg								
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg								
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg								
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg								
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA_SO_VOCs_VPHs	1,4-Dioxane	123-91-1	mg/kg								
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg								
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg								
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg								
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg								
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg								
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg								
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg								
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg								
RA_SO_VOCs_VPHs	Acrylonitrile	107-13-1	mg/kg								
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg								
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg								
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg								
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg								
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg								
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg								
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg								
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg								
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg								
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg								
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg								
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg								
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg								
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg								
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg								
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg								
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg								
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg								
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg								
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg								
RA_SO_VOCs_VPHs	Diethylether	60-29-7	mg/kg								
RA_SO_VOCs_VPHs	Diisopropyl Ether	108-20-3	mg/kg								
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg								
RA_SO_VOCs_VPHs	Freon 113	76-13-1	mg/kg								
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg								
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	ISM-BG1	ISM-BG5	ISM-BG5	ISM-BG5	ISM-BG5	ISM-BG5	ISM-BG5
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	ISM-BG1-3-CI19-0-1	ISM-BG5-1-CI19-1-3	ISM-BG5-2-CI19-1-3	ISM-BG5-3-CI19-1-3	ISM-BG5-1-CI19-0-1	ISM-BG5-2-CI19-0-1	ISM-BG5-3-CI19-0-1
				Sample Date	10/10/2019	10/9/2019	10/9/2019	10/9/2019	10/10/2019	10/10/2019	10/10/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	1 - 3 ft	1 - 3 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg								
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg								
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg								
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg								
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg								
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg								
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg								
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg								
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg								
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg								
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg								
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg								
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg								
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg								
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg								
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg								
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg								
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg								
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg								
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg								
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg								
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg								
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg								
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg								

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	ISM-UPS	ISM-UPS	ISM-UPS	ISM-UPS	ISM-UPS	ISM-UPS	SB-101
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	ISM-UPS-1-CI19-0-1	ISM-UPS-1-CI19-1-3	ISM-UPS-2-CI19-0-1	ISM-UPS-2-CI19-1-3	ISM-UPS-3-CI19-0-1	ISM-UPS-3-CI19-1-3	SB-101A 0-4
				Sample Date	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	11/16/2011
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 4 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO Metals	Aluminum	7429-90-5	mg/kg								
RA SO Metals	Antimony	7440-36-0	mg/kg								
RA SO Metals	Arsenic	7440-38-2	mg/kg								3.2
RA SO Metals	Barium	7440-39-3	mg/kg								7.2
RA SO Metals	Beryllium	7440-41-7	mg/kg								
RA SO Metals	Cadmium	7440-43-9	mg/kg								0.5 U
RA SO Metals	Calcium	7440-70-2	mg/kg								
RA SO Metals	Chromium	7440-47-3	mg/kg								3.6
RA SO Metals	Cobalt	7440-48-4	mg/kg								
RA SO Metals	Copper	7440-50-8	mg/kg								
RA SO Metals	Iron	7439-89-6	mg/kg								
RA SO Metals	Lead	7439-92-1	mg/kg								2.6 J
RA SO Metals	Magnesium	7439-95-4	mg/kg								
RA SO Metals	Manganese	7439-96-5	mg/kg								
RA SO Metals	Mercury	7439-97-6	mg/kg								0.034 U
RA SO Metals	Nickel	7440-02-0	mg/kg								
RA SO Metals	Potassium	7440-09-7	mg/kg								
RA SO Metals	Selenium	7782-49-2	mg/kg								4.6 U
RA SO Metals	Silver	7440-22-4	mg/kg								0.5 U
RA SO Metals	Sodium	7440-23-5	mg/kg								
RA SO Metals	Thallium	7440-28-0	mg/kg								
RA SO Metals	Vanadium	7440-62-2	mg/kg								
RA SO Metals	Zinc	7440-66-6	mg/kg								
RA SO Other	Total Organic Carbon	TOC	mg/kg								4220
RA SO Pest PCBs	Aroclor 1016	12674-11-2	mg/kg	0.0084 U	0.008 U	0.0078 U	0.0077 U	0.0084 U	0.0081 U		
RA SO Pest PCBs	Aroclor 1221	11104-28-2	mg/kg	0.0084 U	0.008 U	0.0078 U	0.0077 U	0.0084 U	0.0081 U		
RA SO Pest PCBs	Aroclor 1232	11141-16-5	mg/kg	0.0098 U	0.0094 U	0.0092 U	0.009 U	0.0099 U	0.0095 U		
RA SO Pest PCBs	Aroclor 1242	53469-21-9	mg/kg	0.0084 U	0.008 U	0.0078 U	0.0077 U	0.0084 U	0.0081 U		
RA SO Pest PCBs	Aroclor 1248	12672-29-6	mg/kg	0.0084 U	0.008 U	0.0078 U	0.0077 U	0.0084 U	0.0081 U		
RA SO Pest PCBs	Aroclor 1254	11097-69-1	mg/kg	0.0084 U	0.008 U	0.0078 U	0.0077 U	0.0084 U	0.0081 U		
RA SO Pest PCBs	Aroclor 1260	11096-82-5	mg/kg	0.2	0.0480	0.22	0.0660	0.14	0.0220		
RA SO Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.2	0.0480 J	0.22	0.0660 J	0.14	0.0220 J		
RA SO Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.25	0.097	0.27	0.11	0.19	0.072		
RA SO SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA SO SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA SO SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA SO SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg								
RA SO SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg								
RA SO SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg								
RA SO SVOCs EPHs	2,4-Dichlorophenol	120-83-2	mg/kg								
RA SO SVOCs EPHs	2,4-Dimethylphenol	105-67-9	mg/kg								
RA SO SVOCs EPHs	2,4-Dinitrophenol	51-28-5	mg/kg								
RA SO SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg								
RA SO SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg								
RA SO SVOCs EPHs	2-Chloronaphthalene	91-58-7	mg/kg								
RA SO SVOCs EPHs	2-Chlorophenol	95-57-8	mg/kg								
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg								
RA SO SVOCs EPHs	2-Methylphenol	95-48-7	mg/kg								
RA SO SVOCs EPHs	2-Nitroaniline	88-74-4	mg/kg								
RA SO SVOCs EPHs	2-Nitrophenol	88-75-5	mg/kg								
RA SO SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg								
RA SO SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg								
RA SO SVOCs EPHs	3-Nitroaniline	99-09-2	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	ISM-UPS	ISM-UPS	ISM-UPS	ISM-UPS	ISM-UPS	ISM-UPS	SB-101
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	ISM-UPS-1-CI19-0-1	ISM-UPS-1-CI19-1-3	ISM-UPS-2-CI19-0-1	ISM-UPS-2-CI19-1-3	ISM-UPS-3-CI19-0-1	ISM-UPS-3-CI19-1-3	SB-101A 0-4
				Sample Date	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	11/16/2011
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 4 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg								
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg								
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg								
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg								
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg								
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg								
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg								
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg								
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg								
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg								
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg								
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg								
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg								
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg								
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg								
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg								
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg								
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg								
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg								
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg								
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg								
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg								
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg								
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg								
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg								
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg								
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg								
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg								
RA_SO_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg								
RA_SO_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	ISM-UPS	ISM-UPS	ISM-UPS	ISM-UPS	ISM-UPS	ISM-UPS	SB-101
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	ISM-UPS-1-CI19-0-1	ISM-UPS-1-CI19-1-3	ISM-UPS-2-CI19-0-1	ISM-UPS-2-CI19-1-3	ISM-UPS-3-CI19-0-1	ISM-UPS-3-CI19-1-3	SB-101A 0-4
				Sample Date	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	11/16/2011
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 4 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg								
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg								
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg								
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg								
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg								
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg								
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg								
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg								
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg								
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg								
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA_SO_VOCs_VPHs	1,4-Dioxane	123-91-1	mg/kg								
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg								
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg								
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg								
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg								
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg								
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg								
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg								
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg								
RA_SO_VOCs_VPHs	Acrylonitrile	107-13-1	mg/kg								
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg								
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg								
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg								
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg								
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg								
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg								
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg								
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg								
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg								
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg								
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg								
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg								
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg								
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg								
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg								
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg								
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg								
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg								
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg								
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg								
RA_SO_VOCs_VPHs	Diethylether	60-29-7	mg/kg								
RA_SO_VOCs_VPHs	Diisopropyl Ether	108-20-3	mg/kg								
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg								
RA_SO_VOCs_VPHs	Freon 113	76-13-1	mg/kg								
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg								
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	ISM-UPS	ISM-UPS	ISM-UPS	ISM-UPS	ISM-UPS	ISM-UPS	SB-101
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	ISM-UPS-1-CI19-0-1	ISM-UPS-1-CI19-1-3	ISM-UPS-2-CI19-0-1	ISM-UPS-2-CI19-1-3	ISM-UPS-3-CI19-0-1	ISM-UPS-3-CI19-1-3	SB-101A 0-4
				Sample Date	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	10/8/2019	11/16/2011
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 4 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg								
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg								
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg								
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg								
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg								
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg								
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg								
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg								
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg								
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg								
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg								
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg								
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg								
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg								
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg								
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg								
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg								
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg								
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg								
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg								
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg								
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg								
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg								
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg								

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-101	SB-101	SB-102	SB-103	SB-103	SB-103	SB-104
				Sample Type Code	N	FD	N	N	N	FD	N
				Sample ID	SB-101A 4-6	SB-101A 4-6 DUP	SB-102A 5-7	SB-103A 0-4	SB-103A 4-6	SB-103A 0-4 DUP	SB-104A 5-7
				Sample Date	11/16/2011	11/16/2011	11/16/2011	11/16/2011	11/16/2011	11/16/2011	11/16/2011
				Depth Interval	4 - 6 ft	4 - 6 ft	5 - 7 ft	0 - 4 ft	4 - 6 ft	0 - 4 ft	5 - 7 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO Metals	Aluminum	7429-90-5	mg/kg								
RA SO Metals	Antimony	7440-36-0	mg/kg								
RA SO Metals	Arsenic	7440-38-2	mg/kg					3.5		3.1	
RA SO Metals	Barium	7440-39-3	mg/kg					11		6	
RA SO Metals	Beryllium	7440-41-7	mg/kg								
RA SO Metals	Cadmium	7440-43-9	mg/kg					0.5 U		0.5 U	
RA SO Metals	Calcium	7440-70-2	mg/kg								
RA SO Metals	Chromium	7440-47-3	mg/kg					12.3		3	
RA SO Metals	Cobalt	7440-48-4	mg/kg								
RA SO Metals	Copper	7440-50-8	mg/kg								
RA SO Metals	Iron	7439-89-6	mg/kg								
RA SO Metals	Lead	7439-92-1	mg/kg					32.8		5 J	
RA SO Metals	Magnesium	7439-95-4	mg/kg								
RA SO Metals	Manganese	7439-96-5	mg/kg								
RA SO Metals	Mercury	7439-97-6	mg/kg					0.01 J		0.035 U	
RA SO Metals	Nickel	7440-02-0	mg/kg								
RA SO Metals	Potassium	7440-09-7	mg/kg								
RA SO Metals	Selenium	7782-49-2	mg/kg					5.2 U		5 U	
RA SO Metals	Silver	7440-22-4	mg/kg					0.5 U		0.5 U	
RA SO Metals	Sodium	7440-23-5	mg/kg								
RA SO Metals	Thallium	7440-28-0	mg/kg								
RA SO Metals	Vanadium	7440-62-2	mg/kg								
RA SO Metals	Zinc	7440-66-6	mg/kg								
RA SO Other	Total Organic Carbon	TOC	mg/kg								
RA SO Pest PCBs	Aroclor 1016	12674-11-2	mg/kg								
RA SO Pest PCBs	Aroclor 1221	11104-28-2	mg/kg								
RA SO Pest PCBs	Aroclor 1232	11141-16-5	mg/kg								
RA SO Pest PCBs	Aroclor 1242	53469-21-9	mg/kg								
RA SO Pest PCBs	Aroclor 1248	12672-29-6	mg/kg								
RA SO Pest PCBs	Aroclor 1254	11097-69-1	mg/kg								
RA SO Pest PCBs	Aroclor 1260	11096-82-5	mg/kg								
RA SO Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg								
RA SO Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg								
RA SO SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA SO SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA SO SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA SO SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg								
RA SO SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg								
RA SO SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg								
RA SO SVOCs EPHs	2,4-Dichlorophenol	120-83-2	mg/kg								
RA SO SVOCs EPHs	2,4-Dimethylphenol	105-67-9	mg/kg								
RA SO SVOCs EPHs	2,4-Dinitrophenol	51-28-5	mg/kg								
RA SO SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg								
RA SO SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg								
RA SO SVOCs EPHs	2-Chloronaphthalene	91-58-7	mg/kg								
RA SO SVOCs EPHs	2-Chlorophenol	95-57-8	mg/kg								
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg								
RA SO SVOCs EPHs	2-Methylphenol	95-48-7	mg/kg								
RA SO SVOCs EPHs	2-Nitroaniline	88-74-4	mg/kg								
RA SO SVOCs EPHs	2-Nitrophenol	88-75-5	mg/kg								
RA SO SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg								
RA SO SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg								
RA SO SVOCs EPHs	3-Nitroaniline	99-09-2	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-101	SB-101	SB-102	SB-103	SB-103	SB-103	SB-104
				Sample Type Code	N	FD	N	N	N	FD	N
				Sample ID	SB-101A 4-6	SB-101A 4-6 DUP	SB-102A 5-7	SB-103A 0-4	SB-103A 4-6	SB-103A 0-4 DUP	SB-104A 5-7
				Sample Date	11/16/2011	11/16/2011	11/16/2011	11/16/2011	11/16/2011	11/16/2011	11/16/2011
				Depth Interval	4 - 6 ft	4 - 6 ft	5 - 7 ft	0 - 4 ft	4 - 6 ft	0 - 4 ft	5 - 7 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg								
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg								
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg								
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg								
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg								
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg								
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg								
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg								
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg								
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg								
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg								
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg								
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg								
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg								
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg								
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg								
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg								
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg								
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg								
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg								
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg								
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg								
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg								
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg								
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg								
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg								
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg								
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg								
RA_SO_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U	
RA_SO_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U	

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-101	SB-101	SB-102	SB-103	SB-103	SB-103	SB-104
				Sample Type Code	N	FD	N	N	N	FD	N
				Sample ID	SB-101A 4-6	SB-101A 4-6 DUP	SB-102A 5-7	SB-103A 0-4	SB-103A 4-6	SB-103A 0-4 DUP	SB-104A 5-7
				Sample Date	11/16/2011	11/16/2011	11/16/2011	11/16/2011	11/16/2011	11/16/2011	11/16/2011
				Depth Interval	4 - 6 ft	4 - 6 ft	5 - 7 ft	0 - 4 ft	4 - 6 ft	0 - 4 ft	5 - 7 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0017 J	0.0013 J	0.0039 J		0.0066		0.0052
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0012 J		0.0009 J
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	1,4-Dioxane	123-91-1	mg/kg							
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg	0.0219 U	0.0216 U	0.0396 U		0.0343 U		0.0271 U
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg	0.0219 U	0.0216 U	0.0396 U		0.0343 U		0.0271 U
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.0219 U	0.0216 U	0.0396 U		0.0343 U		0.0271 U
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg	0.0219 U	0.0216 U	0.0039 J		0.0052 J		0.003 J
RA_SO_VOCs_VPHs	Acrylonitrile	107-13-1	mg/kg							
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg	0.0044 U	0.0043 U	0.0079 U		0.0069 U		0.0054 U
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg							
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg							
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg							
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg	0.0044 U	0.0043 U	0.0079 U		0.0069 U		0.0054 U
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg	0.0044 U	0.0043 U	0.0079 U		0.0069 U		0.0054 U
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0044 U	0.0043 U	0.0079 U		0.0069 U		0.0054 U
RA_SO_VOCs_VPHs	Diethylether	60-29-7	mg/kg							
RA_SO_VOCs_VPHs	Diisopropyl Ether	108-20-3	mg/kg							
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Freon 113	76-13-1	mg/kg							
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-101	SB-101	SB-102	SB-103	SB-103	SB-103	SB-104
				Sample Type Code	N	FD	N	N	N	FD	N
				Sample ID	SB-101A 4-6	SB-101A 4-6 DUP	SB-102A 5-7	SB-103A 0-4	SB-103A 4-6	SB-103A 0-4 DUP	SB-104A 5-7
				Sample Date	11/16/2011	11/16/2011	11/16/2011	11/16/2011	11/16/2011	11/16/2011	11/16/2011
				Depth Interval	4 - 6 ft	4 - 6 ft	5 - 7 ft	0 - 4 ft	4 - 6 ft	0 - 4 ft	5 - 7 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	0.0044 U	0.0043 U	0.0079 U		0.0069 U		0.0054 U
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg	0.011 U	0.0108 U	0.0198 U		0.0172 U		0.0136 U
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg	2.2 U	2.2 U	4 U		3.4 U		2.7 U
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg	0.0022 U	0.0022 U	0.004 U		0.001 J		0.0008 J
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg							
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg							
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg							
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg							
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg							
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.0066 U	0.0065 U	0.012 U		0.010 U		0.0081 U
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg							
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg	0.0022 U	0.0022 U	0.004 U		0.0034 U		0.0027 U
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg	0.0044 U	0.0043 U	0.0079 U		0.0069 U		0.0054 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-105	SB-105	SB-107	SB-108	SB-108	SB-108	SB-108
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-105A 8-10	SB-105A 8-12	SB107A 7-9	SB-108A 0-4	SB-108A 10-12	SB-108A 10-14	SB-108A 4-8
				Sample Date	11/16/2011	11/16/2011	11/18/2011	11/18/2011	11/18/2011	11/18/2011	11/18/2011
				Depth Interval	8 - 10 ft	8 - 12 ft	7 - 9 ft	0 - 4 ft	10 - 12 ft	10 - 14 ft	4 - 8 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO Metals	Aluminum	7429-90-5	mg/kg								
RA SO Metals	Antimony	7440-36-0	mg/kg								
RA SO Metals	Arsenic	7440-38-2	mg/kg					4			1.6 J
RA SO Metals	Barium	7440-39-3	mg/kg					9.3			4.9
RA SO Metals	Beryllium	7440-41-7	mg/kg								
RA SO Metals	Cadmium	7440-43-9	mg/kg					0.5 U			0.5 U
RA SO Metals	Calcium	7440-70-2	mg/kg								
RA SO Metals	Chromium	7440-47-3	mg/kg					3.3			0.8 J
RA SO Metals	Cobalt	7440-48-4	mg/kg								
RA SO Metals	Copper	7440-50-8	mg/kg								
RA SO Metals	Iron	7439-89-6	mg/kg								
RA SO Metals	Lead	7439-92-1	mg/kg					3.6 J			1.6 J
RA SO Metals	Magnesium	7439-95-4	mg/kg								
RA SO Metals	Manganese	7439-96-5	mg/kg								
RA SO Metals	Mercury	7439-97-6	mg/kg					0.03 U			0.033 U
RA SO Metals	Nickel	7440-02-0	mg/kg								
RA SO Metals	Potassium	7440-09-7	mg/kg								
RA SO Metals	Selenium	7782-49-2	mg/kg					5.1 U			5 U
RA SO Metals	Silver	7440-22-4	mg/kg					0.5 U			0.5 U
RA SO Metals	Sodium	7440-23-5	mg/kg								
RA SO Metals	Thallium	7440-28-0	mg/kg								
RA SO Metals	Vanadium	7440-62-2	mg/kg								
RA SO Metals	Zinc	7440-66-6	mg/kg								
RA SO Other	Total Organic Carbon	TOC	mg/kg			1050				1060	
RA SO Pest PCBs	Aroclor 1016	12674-11-2	mg/kg								
RA SO Pest PCBs	Aroclor 1221	11104-28-2	mg/kg								
RA SO Pest PCBs	Aroclor 1232	11141-16-5	mg/kg								
RA SO Pest PCBs	Aroclor 1242	53469-21-9	mg/kg								
RA SO Pest PCBs	Aroclor 1248	12672-29-6	mg/kg								
RA SO Pest PCBs	Aroclor 1254	11097-69-1	mg/kg								
RA SO Pest PCBs	Aroclor 1260	11096-82-5	mg/kg								
RA SO Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg								
RA SO Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg								
RA SO SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA SO SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA SO SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA SO SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg								
RA SO SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg								
RA SO SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg								
RA SO SVOCs EPHs	2,4-Dichlorophenol	120-83-2	mg/kg								
RA SO SVOCs EPHs	2,4-Dimethylphenol	105-67-9	mg/kg								
RA SO SVOCs EPHs	2,4-Dinitrophenol	51-28-5	mg/kg								
RA SO SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg								
RA SO SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg								
RA SO SVOCs EPHs	2-Chloronaphthalene	91-58-7	mg/kg								
RA SO SVOCs EPHs	2-Chlorophenol	95-57-8	mg/kg								
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg								
RA SO SVOCs EPHs	2-Methylphenol	95-48-7	mg/kg								
RA SO SVOCs EPHs	2-Nitroaniline	88-74-4	mg/kg								
RA SO SVOCs EPHs	2-Nitrophenol	88-75-5	mg/kg								
RA SO SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg								
RA SO SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg								
RA SO SVOCs EPHs	3-Nitroaniline	99-09-2	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-105	SB-105	SB-107	SB-108	SB-108	SB-108	SB-108
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-105A 8-10	SB-105A 8-12	SB107A 7-9	SB-108A 0-4	SB-108A 10-12	SB-108A 10-14	SB-108A 4-8
				Sample Date	11/16/2011	11/16/2011	11/18/2011	11/18/2011	11/18/2011	11/18/2011	11/18/2011
				Depth Interval	8 - 10 ft	8 - 12 ft	7 - 9 ft	0 - 4 ft	10 - 12 ft	10 - 14 ft	4 - 8 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg								
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg								
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg								
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg								
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg								
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg								
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg								
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg								
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg								
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg								
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg								
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg								
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg								
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg								
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg								
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg								
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg								
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg								
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg								
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg								
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg								
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg								
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg								
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg								
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg								
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg								
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg								
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg								
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg								
RA_SO_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U	
RA_SO_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U	

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-105	SB-105	SB-107	SB-108	SB-108	SB-108	SB-108
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-105A 8-10	SB-105A 8-12	SB107A 7-9	SB-108A 0-4	SB-108A 10-12	SB-108A 10-14	SB-108A 4-8
				Sample Date	11/16/2011	11/16/2011	11/18/2011	11/18/2011	11/18/2011	11/18/2011	11/18/2011
				Depth Interval	8 - 10 ft	8 - 12 ft	7 - 9 ft	0 - 4 ft	10 - 12 ft	10 - 14 ft	4 - 8 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO VOCs VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,1-Dichloroethane	75-34-3	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,1-Dichloroethene	75-35-4	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,1-Dichloropropene	563-58-6	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,2-Dibromoethane	106-93-4	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,2-Dichloroethane	107-06-2	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,2-Dichloropropane	78-87-5	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,3-Dichloropropane	142-28-9	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	1,4-Dioxane	123-91-1	mg/kg							
RA SO VOCs VPHs	2,2-Dichloropropane	594-20-7	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	2-Butanone (MEK)	78-93-3	mg/kg	0.0369 U		0.0532 U	0.05 U	0.0443 U		0.0413 U
RA SO VOCs VPHs	2-Chlorotoluene	95-49-8	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	2-Hexanone	591-78-6	mg/kg	0.0369 U		0.0532 U	0.05 U	0.0443 U		0.0413 U
RA SO VOCs VPHs	4-Chlorotoluene	106-43-4	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	4-Isopropyltoluene	99-87-6	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.0369 U		0.0532 U	0.05 U	0.0443 U		0.0413 U
RA SO VOCs VPHs	Acetone	67-64-1	mg/kg	0.0369 U		0.0532 U	0.05 U	0.0443 U		0.0413 U
RA SO VOCs VPHs	Acrylonitrile	107-13-1	mg/kg							
RA SO VOCs VPHs	Benzene	71-43-2	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	Bromobenzene	108-86-1	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	Bromochloromethane	74-97-5	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	Bromodichloromethane	75-27-4	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	Bromoform	75-25-2	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	Bromomethane	74-83-9	mg/kg	0.0074 U		0.0106 U	0.01 U	0.0089 U		0.0083 U
RA SO VOCs VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg							
RA SO VOCs VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg							
RA SO VOCs VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg							
RA SO VOCs VPHs	Carbon Disulfide	75-15-0	mg/kg	0.0037 U		0.0048 J	0.0016 J	0.0036 J		0.0041 U
RA SO VOCs VPHs	Carbon Tetrachloride	56-23-5	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	Chlorobenzene	108-90-7	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	Chloroethane	75-00-3	mg/kg	0.0074 U		0.0106 U	0.01 U	0.0089 U		0.0083 U
RA SO VOCs VPHs	Chloroform	67-66-3	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	Chloromethane	74-87-3	mg/kg	0.0074 U		0.0106 U	0.01 U	0.0089 U		0.0083 U
RA SO VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	dibromochloromethane	124-48-1	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	Dibromomethane	74-95-3	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0074 U		0.0106 U	0.01 U	0.0089 U		0.0083 U
RA SO VOCs VPHs	Diethylether	60-29-7	mg/kg							
RA SO VOCs VPHs	Diisopropyl Ether	108-20-3	mg/kg							
RA SO VOCs VPHs	Ethylbenzene	100-41-4	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	Freon 113	76-13-1	mg/kg							
RA SO VOCs VPHs	Hexachlorobutadiene	87-68-3	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA SO VOCs VPHs	Isopropylbenzene	98-82-8	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-105	SB-105	SB-107	SB-108	SB-108	SB-108	SB-108
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-105A 8-10	SB-105A 8-12	SB107A 7-9	SB-108A 0-4	SB-108A 10-12	SB-108A 10-14	SB-108A 4-8
				Sample Date	11/16/2011	11/16/2011	11/18/2011	11/18/2011	11/18/2011	11/18/2011	11/18/2011
				Depth Interval	8 - 10 ft	8 - 12 ft	7 - 9 ft	0 - 4 ft	10 - 12 ft	10 - 14 ft	4 - 8 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	0.0074 U		0.0106 U	0.01 U	0.0089 U		0.0083 U
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg	0.0185 U		0.0266 U	0.025 U	0.0222 U		0.0207 U
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg	3.7 U		5.3 U	5 U	4.4 U		4.1 U
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg							
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg							
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg							
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg							
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg							
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.011 U		0.016 U	0.015 U	0.013 U		0.012 U
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg							
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg	0.0037 U		0.0053 U	0.005 U	0.0044 U		0.0041 U
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg	0.0074 U		0.0106 U	0.01 U	0.0089 U		0.0083 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-108	SB-108	SB-301	SB-301	SB-301	SB-301	SB-302
				Sample Type Code	N	FD	N	N	FD	FD	N
				Sample ID	SB-108A 8-12	SB-108A 0-4 (2)	SB-301-CI19-0-1	SB-301-CI19-1-3	SB-301-CI19-0-1-DUP	SB-301-CI19-1-3-DUP	SB-302-CI19-0-1
				Sample Date	11/18/2011	11/18/2011	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019
				Depth Interval	8 - 12 ft	0 - 4 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_Metals	Aluminum	7429-90-5	mg/kg			5360	4690	5810	4540	4700
RA_SO_Metals	Antimony	7440-36-0	mg/kg			0.0740	0.100	0.110	0.110	0.400 J
RA_SO_Metals	Arsenic	7440-38-2	mg/kg	2.5	2.4 J	1.69	1.24	1.69	1.32	1.91
RA_SO_Metals	Barium	7440-39-3	mg/kg	4.5	5	15.8	14.3	18.9	13.2	20.4
RA_SO_Metals	Beryllium	7440-41-7	mg/kg			0.499	0.385	0.499	0.410	0.382
RA_SO_Metals	Cadmium	7440-43-9	mg/kg	0.1 J	0.2 J	2.50	2.40	2.82	2.68	1.16
RA_SO_Metals	Calcium	7440-70-2	mg/kg			423	337	470	354	391 J
RA_SO_Metals	Chromium	7440-47-3	mg/kg	1.4	1.7	13.0	14.9	12.1	13.9	12.9
RA_SO_Metals	Cobalt	7440-48-4	mg/kg			2.60	2.18	2.76	1.95	2.32
RA_SO_Metals	Copper	7440-50-8	mg/kg			8.90	8.91	9.90	7.08	31.1 J
RA_SO_Metals	Iron	7439-89-6	mg/kg			8130	6360	8650	6880	8090
RA_SO_Metals	Lead	7439-92-1	mg/kg	1.7 J	1.9 J	123	96.8	98.8	106	383
RA_SO_Metals	Magnesium	7439-95-4	mg/kg			1240	908	1380	768	1040
RA_SO_Metals	Manganese	7439-96-5	mg/kg			99.0	59.8	116	63.0	82.0 J
RA_SO_Metals	Mercury	7439-97-6	mg/kg	0.034 U	0.03 U	0.0140 J	0.0130 J	0.0190 J	0.0120 J	0.0160 J
RA_SO_Metals	Nickel	7440-02-0	mg/kg			5.56	4.48	5.79	4.22	6.05
RA_SO_Metals	Potassium	7440-09-7	mg/kg			582	392	648	363	416
RA_SO_Metals	Selenium	7782-49-2	mg/kg	4.8 U	4.9 U	0.100 J	0.0850 J	0.110 J	0.0980 J	0.0800 J
RA_SO_Metals	Silver	7440-22-4	mg/kg	0.5 U	0.5 U	0.0644 J	0.0393 J	0.0744 J	0.0390 J	11.5 J
RA_SO_Metals	Sodium	7440-23-5	mg/kg			30 U	21 U	33 U	25 U	35 U
RA_SO_Metals	Thallium	7440-28-0	mg/kg			0.0873	0.0554	0.0867	0.0510 J	0.0660 J
RA_SO_Metals	Vanadium	7440-62-2	mg/kg			8.99	8.13	9.20	7.20	7.61
RA_SO_Metals	Zinc	7440-66-6	mg/kg			39.0	59.1 J	45.9	32.9 J	45.1 J
RA_SO_Other	Total Organic Carbon	TOC	mg/kg			23000		22000		18000
RA_SO_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg							
RA_SO_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg							
RA_SO_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg							
RA_SO_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	1-Methylnaphthalene	90-12-0	mg/kg			0.00640 J	0.00640 J	0.00510 J	0.0110 J	0.00380 J
RA_SO_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg			0.63 U	0.62 U	0.64 U	0.63 U	0.63 U
RA_SO_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	mg/kg			0.63 U	0.62 U	0.64 U	0.63 U	0.63 U
RA_SO_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	2-Chlorophenol	95-57-8	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	2-Methylnaphthalene	91-57-6	mg/kg			0.0110 J	0.0120 J	0.00790 J	0.0190 J	0.00670 J
RA_SO_SVOCs_EPHs	2-Methylphenol	95-48-7	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	2-Nitroaniline	88-74-4	mg/kg			0.63 U	0.62 U	0.64 U	0.63 U	0.63 U
RA_SO_SVOCs_EPHs	2-Nitrophenol	88-75-5	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U
RA_SO_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg			0.25 UJ	0.25 UJ	0.26 UJ	0.26 UJ	
RA_SO_SVOCs_EPHs	3-Nitroaniline	99-09-2	mg/kg			0.63 U	0.62 U	0.64 U	0.63 U	0.63 UJ

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-108	SB-108	SB-301	SB-301	SB-301	SB-301	SB-302
				Sample Type Code	N	FD	N	N	FD	FD	N
				Sample ID	SB-108A 8-12	SB-108A 0-4 (2)	SB-301-CI19-0-1	SB-301-CI19-1-3	SB-301-CI19-0-1-DUP	SB-301-CI19-1-3-DUP	SB-302-CI19-0-1
				Sample Date	11/18/2011	11/18/2011	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019
				Depth Interval	8 - 12 ft	0 - 4 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO SVOCs EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg			0.63 U	0.62 U	0.64 U	0.63 U	0.63 U	
RA SO SVOCs EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	4-Chloroaniline	106-47-8	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	4-Nitroaniline	100-01-6	mg/kg			0.63 U	0.62 U	0.64 U	0.63 U	0.63 UJ	
RA SO SVOCs EPHs	4-Nitrophenol	100-02-7	mg/kg			0.63 U	0.62 U	0.64 U	0.63 U	0.63 U	
RA SO SVOCs EPHs	Acenaphthene	83-32-9	mg/kg			0.0400	0.01 U	0.0310	0.01 U	0.01 U	
RA SO SVOCs EPHs	Acenaphthylene	208-96-8	mg/kg			0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	
RA SO SVOCs EPHs	Anthracene	120-12-7	mg/kg			0.0720	0.01 U	0.0590	0.00330 J	0.00540 J	
RA SO SVOCs EPHs	Benzo(a)anthracene	56-55-3	mg/kg			0.19	0.01 U	0.21	0.01 U	0.0520 J	
RA SO SVOCs EPHs	Benzo(a)Pyrene	50-32-8	mg/kg			0.14	0.01 U	0.2	0.0220	0.0710 J	
RA SO SVOCs EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg			0.2	0.01 U	0.27	0.0360	0.14 J	
RA SO SVOCs EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg			0.11	0.0210	0.15	0.0240	0.0760 J	
RA SO SVOCs EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg			0.0970	0.00820 J	0.13	0.0160 J	0.0520	
RA SO SVOCs EPHs	Benzoic acid	65-85-0	mg/kg			7.8 J	0.62 U	2.1 J	0.63 U	0.63 U	
RA SO SVOCs EPHs	Benzyl Alcohol	100-51-6	mg/kg			0.51 U	0.5 U	0.51 U	0.51 U	0.5 U	
RA SO SVOCs EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.22 J	
RA SO SVOCs EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg								
RA SO SVOCs EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg								
RA SO SVOCs EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg								
RA SO SVOCs EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg								
RA SO SVOCs EPHs	Carbazole	86-74-8	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Chrysene	218-01-9	mg/kg			0.2	0.01 U	0.24	0.01 U	0.0790 J	
RA SO SVOCs EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg			0.0390	0.00580 J	0.0540	0.01 U	0.0220 J	
RA SO SVOCs EPHs	Dibenzofuran	132-64-9	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Diethyl Phthalate	84-66-2	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Dimethyl Phthalate	131-11-3	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Fluoranthene	206-44-0	mg/kg			0.27	0.01 U	0.32	0.01 U	0.0510 J	
RA SO SVOCs EPHs	Fluorene	86-73-7	mg/kg			0.0410	0.01 U	0.0290	0.01 U	0.01 U	
RA SO SVOCs EPHs	Hexachlorobenzene	118-74-1	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Hexachloroethane	67-72-1	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg			0.11	0.0190 J	0.13	0.0180 J	0.0510 J	
RA SO SVOCs EPHs	Isophorone	78-59-1	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Naphthalene	91-20-3	mg/kg			0.0130 J	0.01 U	0.01 U	0.0140 J	0.01 U	
RA SO SVOCs EPHs	Nitrobenzene	98-95-3	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Pentachlorophenol	87-86-5	mg/kg			0.63 U	0.62 U	0.64 U	0.63 U	0.63 U	
RA SO SVOCs EPHs	Phenanthrene	85-01-8	mg/kg			0.35	0.0130 J	0.3	0.0270	0.0400 J	
RA SO SVOCs EPHs	Phenol	108-95-2	mg/kg			0.25 U	0.25 U	0.26 U	0.26 U	0.25 U	
RA SO SVOCs EPHs	Pyrene	129-00-0	mg/kg			0.41 J	0.0100 J	0.41 J	0.0320	0.13 J	
RA SO SVOCs EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg			1.8	0.099	2.1	0.19	0.72	
RA SO SVOCs EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg			0.54	0.063	0.44	0.084	0.077	
RA SO SVOCs EPHs	Total PAHs (b)	Tot-PAH	mg/kg			2.3	0.16	2.6	0.24	0.80	
RA SO VOCs VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg								
RA SO VOCs VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-108	SB-108	SB-301	SB-301	SB-301	SB-301	SB-302
				Sample Type Code	N	FD	N	N	FD	FD	N
				Sample ID	SB-108A 8-12	SB-108A 0-4 (2)	SB-301-CI19-0-1	SB-301-CI19-1-3	SB-301-CI19-0-1-DUP	SB-301-CI19-1-3-DUP	SB-302-CI19-0-1
				Sample Date	11/18/2011	11/18/2011	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019
				Depth Interval	8 - 12 ft	0 - 4 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO VOCs VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg								
RA SO VOCs VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg								
RA SO VOCs VPHs	1,1-Dichloroethane	75-34-3	mg/kg								
RA SO VOCs VPHs	1,1-Dichloroethene	75-35-4	mg/kg								
RA SO VOCs VPHs	1,1-Dichloropropene	563-58-6	mg/kg								
RA SO VOCs VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg								
RA SO VOCs VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg								
RA SO VOCs VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA SO VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg								
RA SO VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg								
RA SO VOCs VPHs	1,2-Dibromoethane	106-93-4	mg/kg								
RA SO VOCs VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA SO VOCs VPHs	1,2-Dichloroethane	107-06-2	mg/kg								
RA SO VOCs VPHs	1,2-Dichloropropane	78-87-5	mg/kg								
RA SO VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg								
RA SO VOCs VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA SO VOCs VPHs	1,3-Dichloropropane	142-28-9	mg/kg								
RA SO VOCs VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA SO VOCs VPHs	1,4-Dioxane	123-91-1	mg/kg								
RA SO VOCs VPHs	2,2-Dichloropropane	594-20-7	mg/kg								
RA SO VOCs VPHs	2-Butanone (MEK)	78-93-3	mg/kg								
RA SO VOCs VPHs	2-Chlorotoluene	95-49-8	mg/kg								
RA SO VOCs VPHs	2-Hexanone	591-78-6	mg/kg								
RA SO VOCs VPHs	4-Chlorotoluene	106-43-4	mg/kg								
RA SO VOCs VPHs	4-Isopropyltoluene	99-87-6	mg/kg								
RA SO VOCs VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg								
RA SO VOCs VPHs	Acetone	67-64-1	mg/kg								
RA SO VOCs VPHs	Acrylonitrile	107-13-1	mg/kg								
RA SO VOCs VPHs	Benzene	71-43-2	mg/kg								
RA SO VOCs VPHs	Bromobenzene	108-86-1	mg/kg								
RA SO VOCs VPHs	Bromochloromethane	74-97-5	mg/kg								
RA SO VOCs VPHs	Bromodichloromethane	75-27-4	mg/kg								
RA SO VOCs VPHs	Bromoform	75-25-2	mg/kg								
RA SO VOCs VPHs	Bromomethane	74-83-9	mg/kg								
RA SO VOCs VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg								
RA SO VOCs VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg								
RA SO VOCs VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg								
RA SO VOCs VPHs	Carbon Disulfide	75-15-0	mg/kg								
RA SO VOCs VPHs	Carbon Tetrachloride	56-23-5	mg/kg								
RA SO VOCs VPHs	Chlorobenzene	108-90-7	mg/kg								
RA SO VOCs VPHs	Chloroethane	75-00-3	mg/kg								
RA SO VOCs VPHs	Chloroform	67-66-3	mg/kg								
RA SO VOCs VPHs	Chloromethane	74-87-3	mg/kg								
RA SO VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg								
RA SO VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg								
RA SO VOCs VPHs	dibromochloromethane	124-48-1	mg/kg								
RA SO VOCs VPHs	Dibromomethane	74-95-3	mg/kg								
RA SO VOCs VPHs	Dichlorodifluoromethane	75-71-8	mg/kg								
RA SO VOCs VPHs	Diethylether	60-29-7	mg/kg								
RA SO VOCs VPHs	Diisopropyl Ether	108-20-3	mg/kg								
RA SO VOCs VPHs	Ethylbenzene	100-41-4	mg/kg								
RA SO VOCs VPHs	Freon 113	76-13-1	mg/kg								
RA SO VOCs VPHs	Hexachlorobutadiene	87-68-3	mg/kg								
RA SO VOCs VPHs	Isopropylbenzene	98-82-8	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-108	SB-108	SB-301	SB-301	SB-301	SB-301	SB-302
				Sample Type Code	N	FD	N	N	FD	FD	N
				Sample ID	SB-108A 8-12	SB-108A 0-4 (2)	SB-301-CI19-0-1	SB-301-CI19-1-3	SB-301-CI19-0-1-DUP	SB-301-CI19-1-3-DUP	SB-302-CI19-0-1
				Sample Date	11/18/2011	11/18/2011	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019
				Depth Interval	8 - 12 ft	0 - 4 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg								
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg								
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg								
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg								
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg								
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg								
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg								
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg								
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg								
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg								
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg								
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg								
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg								
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg								
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg								
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg								
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg								
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg								
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg								
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg								
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg								
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg								
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg								
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg								

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-302	SB-303	SB-303	SB-304	SB-304	SB-305	SB-305
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-302-CI19-1-3	SB-303-CI19-0-1	SB-303-CI19-1-3	SB-304-CI19-0-1	SB-304-CI19-1-3	SB-305-CI19-0-1	SB-305-CI19-1-3
				Sample Date	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_Metals	Aluminum	7429-90-5	mg/kg	3800	8100	4890	5910	5600	5260	6020
RA_SO_Metals	Antimony	7440-36-0	mg/kg	0.0360 J	0.0970	0.140 J	0.140	0.179	0.312	0.212
RA_SO_Metals	Arsenic	7440-38-2	mg/kg	1.08	4.39	2.09	2.14	3.32	1.68	2.12
RA_SO_Metals	Barium	7440-39-3	mg/kg	9.25	23.0	15.3	10.5	16.6	11.4	15.2
RA_SO_Metals	Beryllium	7440-41-7	mg/kg	0.469	0.526	0.420	0.518	0.485	0.490	0.482
RA_SO_Metals	Cadmium	7440-43-9	mg/kg	0.0921	0.160	0.303	0.747	2.83	1.26	2.39
RA_SO_Metals	Calcium	7440-70-2	mg/kg	308	579	432 J	367	402	426	404
RA_SO_Metals	Chromium	7440-47-3	mg/kg	3.91	9.14	9.19	8.19	9.82	12.4	12.4
RA_SO_Metals	Cobalt	7440-48-4	mg/kg	1.99	3.72	2.41	4.14	3.12	3.18	3.07
RA_SO_Metals	Copper	7440-50-8	mg/kg	4.61	11.4	13.3	16.9	17.9	25.2	25.5
RA_SO_Metals	Iron	7439-89-6	mg/kg	6200	10600	8380	10700	9080	9370	9010
RA_SO_Metals	Lead	7439-92-1	mg/kg	5.92	51.8	129	22.1	28.1	27.8	31.6
RA_SO_Metals	Magnesium	7439-95-4	mg/kg	758	1710	929 J	1780	1220	1270	1340
RA_SO_Metals	Manganese	7439-96-5	mg/kg	95.5	131	91.1 J	119	103	101	104
RA_SO_Metals	Mercury	7439-97-6	mg/kg	0.017 U	0.0180 J	0.0260 J	0.0410	0.126	0.0450	0.0544
RA_SO_Metals	Nickel	7440-02-0	mg/kg	3.34	7.37	5.43	12.5	6.30	9.96	6.96
RA_SO_Metals	Potassium	7440-09-7	mg/kg	332	639	484	539	742	479	516
RA_SO_Metals	Selenium	7782-49-2	mg/kg	0.0960 J	0.200 J	0.100 J	0.120 J	0.150 J	0.100 J	0.140 J
RA_SO_Metals	Silver	7440-22-4	mg/kg	0.0170 J	0.0508 J	0.107	0.103	0.128	0.134	0.293
RA_SO_Metals	Sodium	7440-23-5	mg/kg	26 U	29 U	31 U	38 U	33 U	27 U	25 U
RA_SO_Metals	Thallium	7440-28-0	mg/kg	0.0610 J	0.119	0.0720 J	0.0820 J	0.102	0.0648 J	0.0786
RA_SO_Metals	Vanadium	7440-62-2	mg/kg	4.42	12.3	7.81 J	8.12	7.76	7.21	8.38
RA_SO_Metals	Zinc	7440-66-6	mg/kg	25.6	53.4	41.5 J	48.4	57.4	57.4	60.6
RA_SO_Other	Total Organic Carbon	TOC	mg/kg	8700 J			8300 J	7400 J		9900 J
RA_SO_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg							
RA_SO_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg							
RA_SO_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg							
RA_SO_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	1-Methylnaphthalene	90-12-0	mg/kg	0.00210 J	0.00500 J	0.00640 J	0.00300 J	0.00720 J	0.011 U	
RA_SO_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg	0.63 U	0.65 U	0.63 U	0.7 U	0.64 U	0.65 U	0.64 U
RA_SO_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	mg/kg	0.63 U	0.65 U	0.63 U	0.7 U	0.64 U	0.65 U	0.64 U
RA_SO_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	2-Chlorophenol	95-57-8	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.00260 J	0.00470 J	0.0110 J	0.00420 J	0.00920 J	0.00240 J	0.00270 J
RA_SO_SVOCs_EPHs	2-Methylphenol	95-48-7	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	2-Nitroaniline	88-74-4	mg/kg	0.63 U	0.65 U	0.63 U	0.7 U	0.64 U	0.65 U	0.64 U
RA_SO_SVOCs_EPHs	2-Nitrophenol	88-75-5	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA_SO_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.26 UJ	0.26 UJ		0.28 UJ	0.26 UJ	0.26 UJ	0.26 UJ
RA_SO_SVOCs_EPHs	3-Nitroaniline	99-09-2	mg/kg	0.63 U	0.65 U	0.63 U	0.7 U	0.64 U	0.65 U	0.64 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-302	SB-303	SB-303	SB-304	SB-304	SB-305	SB-305
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-302-CI19-1-3	SB-303-CI19-0-1	SB-303-CI19-1-3	SB-304-CI19-0-1	SB-304-CI19-1-3	SB-305-CI19-0-1	SB-305-CI19-1-3
				Sample Date	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO SVOCs EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	0.63 U	0.65 U	0.63 U	0.7 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	4-Chloroaniline	106-47-8	mg/kg	0.26 U	0.26 U	0.26 UJ	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	4-Nitroaniline	100-01-6	mg/kg	0.63 U	0.65 U	0.63 U	0.7 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	4-Nitrophenol	100-02-7	mg/kg	0.63 U	0.65 U	0.63 U	0.7 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	Acenaphthene	83-32-9	mg/kg	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	
RA SO SVOCs EPHs	Acenaphthylene	208-96-8	mg/kg	0.01 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	
RA SO SVOCs EPHs	Anthracene	120-12-7	mg/kg	0.01 U	0.00370 J	0.00500 J	0.011 U	0.0180 J	0.0380	0.00630 J
RA SO SVOCs EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.01 U	0.0380	0.0650	0.0750	0.14	0.22	0.0420 J
RA SO SVOCs EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.01 U	0.0540	0.0950 J	0.11	0.13	0.28	0.01 UJ
RA SO SVOCs EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.01 U	0.0600	0.26 J	0.18	0.22	0.36	0.0320 J
RA SO SVOCs EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.00530 J	0.0370	0.0660 J	0.1	0.1	0.18	
RA SO SVOCs EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.00830 J	0.0250	0.0760 J	0.0670	0.0930	0.14	0.0180 J
RA SO SVOCs EPHs	Benzoic acid	65-85-0	mg/kg	0.63 U	0.65 U	0.63 U	0.7 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	Benzyl Alcohol	100-51-6	mg/kg	0.51 U	0.52 U	0.51 U	0.57 U	0.51 U	0.52 U	0.51 U
RA SO SVOCs EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.2 J	0.26 U
RA SO SVOCs EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg							
RA SO SVOCs EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg							
RA SO SVOCs EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg							
RA SO SVOCs EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg							
RA SO SVOCs EPHs	Carbazole	86-74-8	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Chrysene	218-01-9	mg/kg	0.01 U	0.0640	0.0940 J	0.15	0.2	0.34	0.0340 J
RA SO SVOCs EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.01 U	0.00710 J	0.0170 J	0.0210 J	0.0330	0.0530	0.00360 J
RA SO SVOCs EPHs	Dibenzofuran	132-64-9	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Diethyl Phthalate	84-66-2	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Dimethyl Phthalate	131-11-3	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Fluoranthene	206-44-0	mg/kg	0.01 U	0.0500	0.0570 J	0.22	0.17	0.61 J	0.0580 J
RA SO SVOCs EPHs	Fluorene	86-73-7	mg/kg	0.01 U	0.00350 J	0.01 U	0.011 U	0.00680 J	0.0120 J	0.00390 J
RA SO SVOCs EPHs	Hexachlorobenzene	118-74-1	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Hexachloroethane	67-72-1	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.01 U	0.0340	0.0530 J	0.1	0.11	0.18	
RA SO SVOCs EPHs	Isophorone	78-59-1	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Naphthalene	91-20-3	mg/kg	0.01 U	0.011 U	0.0110 J	0.011 U	0.01 U	0.011 U	
RA SO SVOCs EPHs	Nitrobenzene	98-95-3	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Pentachlorophenol	87-86-5	mg/kg	0.63 U	0.65 U	0.63 U	0.7 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	Phenanthrene	85-01-8	mg/kg	0.0130 J	0.0530	0.0430 J	0.0920	0.0980	0.37	0.0370 J
RA SO SVOCs EPHs	Phenol	108-95-2	mg/kg	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Pyrene	129-00-0	mg/kg	0.00670 J	0.0850	0.1 J	0.19	0.17	0.5 J	0.00860 J
RA SO SVOCs EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	0.068	0.45	0.88	1.2	1.4	2.9	0.20
RA SO SVOCs EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.030	0.082	0.094	0.12	0.16	0.43	0.050
RA SO SVOCs EPHs	Total PAHs (b)	Tot-PAH	mg/kg	0.097	0.54	0.98	1.3	1.5	3.3	0.25
RA SO VOCs VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg							
RA SO VOCs VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg							

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-302	SB-303	SB-303	SB-304	SB-304	SB-305	SB-305
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-302-CI19-1-3	SB-303-CI19-0-1	SB-303-CI19-1-3	SB-304-CI19-0-1	SB-304-CI19-1-3	SB-305-CI19-0-1	SB-305-CI19-1-3
				Sample Date	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg								
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg								
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg								
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg								
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg								
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg								
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg								
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg								
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg								
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg								
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg								
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA_SO_VOCs_VPHs	1,4-Dioxane	123-91-1	mg/kg								
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg								
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg								
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg								
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg								
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg								
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg								
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg								
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg								
RA_SO_VOCs_VPHs	Acrylonitrile	107-13-1	mg/kg								
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg								
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg								
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg								
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg								
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg								
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg								
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg								
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg								
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg								
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg								
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg								
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg								
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg								
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg								
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg								
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg								
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg								
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg								
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg								
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg								
RA_SO_VOCs_VPHs	Diethylether	60-29-7	mg/kg								
RA_SO_VOCs_VPHs	Diisopropyl Ether	108-20-3	mg/kg								
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg								
RA_SO_VOCs_VPHs	Freon 113	76-13-1	mg/kg								
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg								
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg								

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-302	SB-303	SB-303	SB-304	SB-304	SB-305	SB-305
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-302-CI19-1-3	SB-303-CI19-0-1	SB-303-CI19-1-3	SB-304-CI19-0-1	SB-304-CI19-1-3	SB-305-CI19-0-1	SB-305-CI19-1-3
				Sample Date	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019	10/9/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg								
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg								
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg								
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg								
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg								
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg								
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg								
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg								
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg								
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg								
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg								
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg								
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg								
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg								
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg								
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg								
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg								
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg								
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg								
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg								
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg								
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg								
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg								
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg								

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-306	SB-306	SB-307	SB-307	SB-308	SB-308	SB-309
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-306-CI19-0-1	SB-306-CI19-1-3	SB-307-CI19-0-1	SB-307-CI19-1-3	SB-308-CI19-0-1	SB-308-CI19-1-3	SB-309-CI19-0-1
				Sample Date	10/9/2019	10/9/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO Metals	Aluminum	7429-90-5	mg/kg		5400	4020	3590	4040	3830	3730	5830
RA SO Metals	Antimony	7440-36-0	mg/kg		0.264	0.130	0.0700 J	0.0840	1.12	0.467	0.0640
RA SO Metals	Arsenic	7440-38-2	mg/kg		1.90	1.30	1.30	1.37	1.40	1.56	1.52
RA SO Metals	Barium	7440-39-3	mg/kg		10.7	9.26	12.6	12.8	10.5	11.3	10.0
RA SO Metals	Beryllium	7440-41-7	mg/kg		0.458	0.376	0.358	0.369	0.376	0.377	0.461
RA SO Metals	Cadmium	7440-43-9	mg/kg		0.565	1.53	0.227	0.411	0.356	0.626	1.42
RA SO Metals	Calcium	7440-70-2	mg/kg		419	228	300	436	370	332	595
RA SO Metals	Chromium	7440-47-3	mg/kg		9.09	5.38	4.45	5.00	6.09	6.62	13.5 J
RA SO Metals	Cobalt	7440-48-4	mg/kg		3.01	2.81	1.84	2.22	2.16	3.55	3.35
RA SO Metals	Copper	7440-50-8	mg/kg		16.8	26.9	6.04	7.49	8.98	7.90	8.15
RA SO Metals	Iron	7439-89-6	mg/kg		9320	7130	5880	6540	6060	6440	8380
RA SO Metals	Lead	7439-92-1	mg/kg		32.7	20.1	70.0	34.5	55.3	41.5	10.0
RA SO Metals	Magnesium	7439-95-4	mg/kg		1250	989	730	849	779	1060	1450 J
RA SO Metals	Manganese	7439-96-5	mg/kg		108	92.6	70.9	90.2	88.3	93.9	100
RA SO Metals	Mercury	7439-97-6	mg/kg		0.0480	0.0420	0.0130 J	0.0130 J	0.00920 J	0.0140 J	0.0330
RA SO Metals	Nickel	7440-02-0	mg/kg		6.53	5.47	3.51	4.37	4.84	9.03	5.76
RA SO Metals	Potassium	7440-09-7	mg/kg		528	436	445	369	344	324	380
RA SO Metals	Selenium	7782-49-2	mg/kg		0.120 J	0.0730 J	0.0940 J	0.100 J	0.100 J	0.250 J	0.120 J
RA SO Metals	Silver	7440-22-4	mg/kg		0.143	0.102	0.0310 J	0.0450 J	0.0430 J	0.0340 J	0.0350 J
RA SO Metals	Sodium	7440-23-5	mg/kg		82.6	33 U	22.0 J	24.3 J	27.6 J	20.0 J	20.0 J
RA SO Metals	Thallium	7440-28-0	mg/kg		0.0745	0.0620 J	0.0670 J	0.0590 J	0.0570 J	0.0700 J	0.0687
RA SO Metals	Vanadium	7440-62-2	mg/kg		7.52	4.93	5.53	5.89	5.31	5.26	7.23
RA SO Metals	Zinc	7440-66-6	mg/kg		50.2	43.4	28.4	33.9	36.5	68.2	109
RA SO Other	Total Organic Carbon	TOC	mg/kg				22000 J	16000 J			13000 J
RA SO Pest PCBs	Aroclor 1016	12674-11-2	mg/kg								
RA SO Pest PCBs	Aroclor 1221	11104-28-2	mg/kg								
RA SO Pest PCBs	Aroclor 1232	11141-16-5	mg/kg								
RA SO Pest PCBs	Aroclor 1242	53469-21-9	mg/kg								
RA SO Pest PCBs	Aroclor 1248	12672-29-6	mg/kg								
RA SO Pest PCBs	Aroclor 1254	11097-69-1	mg/kg								
RA SO Pest PCBs	Aroclor 1260	11096-82-5	mg/kg								
RA SO Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg								
RA SO Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg								
RA SO SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg		0.00220 J	0.01 UJ	0.00380 J	0.00310 J	0.00220 J	0.0180 J	0.00340 J
RA SO SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg		0.63 U	0.62 U	0.64 U	0.63 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	2,4-Dichlorophenol	120-83-2	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	2,4-Dimethylphenol	105-67-9	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	2,4-Dinitrophenol	51-28-5	mg/kg		0.63 U	0.62 U	0.64 U	0.63 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	2-Chloronaphthalene	91-58-7	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	2-Chlorophenol	95-57-8	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg		0.00330 J	0.01 UJ	0.00520 J	0.00470 J	0.00360 J	0.0180 J	0.00500 J
RA SO SVOCs EPHs	2-Methylphenol	95-48-7	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	2-Nitroaniline	88-74-4	mg/kg		0.63 U	0.62 U	0.64 U	0.63 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	2-Nitrophenol	88-75-5	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg		0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg		0.25 UJ	0.25 UJ	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	3-Nitroaniline	99-09-2	mg/kg		0.63 U	0.62 U	0.64 U	0.63 U	0.64 U	0.65 U	0.64 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-306	SB-306	SB-307	SB-307	SB-308	SB-308	SB-309
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-306-CI19-0-1	SB-306-CI19-1-3	SB-307-CI19-0-1	SB-307-CI19-1-3	SB-308-CI19-0-1	SB-308-CI19-1-3	SB-309-CI19-0-1
				Sample Date	10/9/2019	10/9/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO SVOCs EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	0.63 U	0.62 U	0.64 U	0.63 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	4-Chloroaniline	106-47-8	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	4-Nitroaniline	100-01-6	mg/kg	0.63 U	0.62 U	0.64 U	0.63 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	4-Nitrophenol	100-02-7	mg/kg	0.63 U	0.62 U	0.64 U	0.63 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	Acenaphthene	83-32-9	mg/kg	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
RA SO SVOCs EPHs	Acenaphthylene	208-96-8	mg/kg	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
RA SO SVOCs EPHs	Anthracene	120-12-7	mg/kg	0.00330 J	0.01 UJ	0.00330 J	0.0140 J	0.00250 J	0.00420 J	0.01 UJ
RA SO SVOCs EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.0340	0.01 UJ	0.0350	0.0640	0.01 U	0.01 U	0.01 U
RA SO SVOCs EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.0450	0.01 U	0.0500	0.0620	0.0200 J	0.0150 J	0.00640 J
RA SO SVOCs EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.0670	0.01 U	0.0790	0.0930	0.0350	0.0180 J	0.00940 J
RA SO SVOCs EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.0350	0.01 UJ	0.0370	0.0360	0.0220	0.01 U	0.01 U
RA SO SVOCs EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.0300	0.00580 J	0.0360	0.0420	0.0210	0.0140 J	0.0100 J
RA SO SVOCs EPHs	Benzoic acid	65-85-0	mg/kg	0.63 U	0.62 U	0.64 U	0.63 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	Benzyl Alcohol	100-51-6	mg/kg	0.5 U	0.5 U	0.52 U	0.51 U	0.51 U	0.52 U	0.52 U
RA SO SVOCs EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg							
RA SO SVOCs EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg							
RA SO SVOCs EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg							
RA SO SVOCs EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg							
RA SO SVOCs EPHs	Carbazole	86-74-8	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Chrysene	218-01-9	mg/kg	0.0500	0.01 U	0.0600	0.0730	0.0260	0.0360	0.00550 J
RA SO SVOCs EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.00700 J	0.01 UJ	0.00840 J	0.0120 J	0.00430 J	0.01 U	0.01 U
RA SO SVOCs EPHs	Dibenzofuran	132-64-9	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Diethyl Phthalate	84-66-2	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Dimethyl Phthalate	131-11-3	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Fluoranthene	206-44-0	mg/kg	0.0640	0.01 U	0.0630	0.11	0.0330	0.01 U	0.01 U
RA SO SVOCs EPHs	Fluorene	86-73-7	mg/kg	0.01 U	0.01 UJ	0.01 U	0.00580 J	0.01 U	0.00460 J	0.01 U
RA SO SVOCs EPHs	Hexachlorobenzene	118-74-1	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Hexachloroethane	67-72-1	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0300	0.01 UJ	0.0460	0.0410	0.01 U	0.01 U	0.01 U
RA SO SVOCs EPHs	Isophorone	78-59-1	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Naphthalene	91-20-3	mg/kg	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.0140 J	0.01 U
RA SO SVOCs EPHs	Nitrobenzene	98-95-3	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Pentachlorophenol	87-86-5	mg/kg	0.63 U	0.62 U	0.64 U	0.63 U	0.64 U	0.65 U	0.64 U
RA SO SVOCs EPHs	Phenanthrene	85-01-8	mg/kg	0.0280	0.01 UJ	0.0410	0.0780	0.0210	0.0230	0.00690 J
RA SO SVOCs EPHs	Phenol	108-95-2	mg/kg	0.25 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U	0.26 U
RA SO SVOCs EPHs	Pyrene	129-00-0	mg/kg	0.0560	0.00450 J	0.0570	0.0810	0.0280	0.0270	0.00860 J
RA SO SVOCs EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	0.42	0.052	0.47	0.61	0.20	0.16	0.077
RA SO SVOCs EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.049	0.080 U	0.070	0.12	0.040	0.090	0.041
RA SO SVOCs EPHs	Total PAHs (b)	Tot-PAH	mg/kg	0.47	0.094	0.55	0.73	0.24	0.22	0.12
RA SO VOCs VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.00530 J	0.0025 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-306	SB-306	SB-307	SB-307	SB-308	SB-308	SB-309
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-306-CI19-0-1	SB-306-CI19-1-3	SB-307-CI19-0-1	SB-307-CI19-1-3	SB-308-CI19-0-1	SB-308-CI19-1-3	SB-309-CI19-0-1
				Sample Date	10/9/2019	10/9/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO VOCs VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,1-Dichloroethane	75-34-3	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,1-Dichloroethene	75-35-4	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,1-Dichloropropene	563-58-6	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,2-Dibromoethane	106-93-4	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,2-Dichloroethane	107-06-2	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,2-Dichloropropane	78-87-5	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,3-Dichloropropane	142-28-9	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	1,4-Dioxane	123-91-1	mg/kg							
RA SO VOCs VPHs	2,2-Dichloropropane	594-20-7	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	2-Butanone (MEK)	78-93-3	mg/kg			0.012 U	0.012 U	0.012 U	0.0130 J	0.012 U
RA SO VOCs VPHs	2-Chlorotoluene	95-49-8	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	2-Hexanone	591-78-6	mg/kg			0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
RA SO VOCs VPHs	4-Chlorotoluene	106-43-4	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	4-Isopropyltoluene	99-87-6	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg			0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
RA SO VOCs VPHs	Acetone	67-64-1	mg/kg			0.012 U	0.0320	0.0320	0.0690 J	0.012 U
RA SO VOCs VPHs	Acrylonitrile	107-13-1	mg/kg							
RA SO VOCs VPHs	Benzene	71-43-2	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Bromobenzene	108-86-1	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Bromochloromethane	74-97-5	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Bromodichloromethane	75-27-4	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Bromoform	75-25-2	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Bromomethane	74-83-9	mg/kg			0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U
RA SO VOCs VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg							
RA SO VOCs VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg							
RA SO VOCs VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg							
RA SO VOCs VPHs	Carbon Disulfide	75-15-0	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Carbon Tetrachloride	56-23-5	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Chlorobenzene	108-90-7	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Chloroethane	75-00-3	mg/kg			0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U
RA SO VOCs VPHs	Chloroform	67-66-3	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Chloromethane	74-87-3	mg/kg			0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U
RA SO VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.00170 J	0.0025 U
RA SO VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	dibromochloromethane	124-48-1	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Dibromomethane	74-95-3	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Dichlorodifluoromethane	75-71-8	mg/kg			0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U
RA SO VOCs VPHs	Diethylether	60-29-7	mg/kg							
RA SO VOCs VPHs	Diisopropyl Ether	108-20-3	mg/kg							
RA SO VOCs VPHs	Ethylbenzene	100-41-4	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Freon 113	76-13-1	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Hexachlorobutadiene	87-68-3	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA SO VOCs VPHs	Isopropylbenzene	98-82-8	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-306	SB-306	SB-307	SB-307	SB-308	SB-308	SB-309
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-306-CI19-0-1	SB-306-CI19-1-3	SB-307-CI19-0-1	SB-307-CI19-1-3	SB-308-CI19-0-1	SB-308-CI19-1-3	SB-309-CI19-0-1
				Sample Date	10/9/2019	10/9/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg			0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg			0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg							
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.00150 J	0.0025 U
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg							
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg							
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg							
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg			0.0025 U	0.00370 J	0.0024 U	0.0025 U	0.0025 U
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg			0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg			0.0025 U	0.00190 J	0.0024 U	0.00180 J	0.00410 J
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg			0.0075 U	0.0074 U	0.0072 U	0.00150 J	0.0075 U
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg			0.0075 U	0.0075 U	0.0072 U	0.0065	0.0075 U
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg			0.0025 U	0.0025 U	0.0024 U	0.0025 U	0.0025 U
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg							
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg			0.00410 J	0.0210	0.00230 J	0.00910 J	0.0025 U
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg			0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg			0.005 U	0.005 U	0.0048 U	0.005 U	0.005 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-309	SB-309	SB-310	SB-310	SB-311	SB-311	SB-312
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	SB-309-CI19-1-3	SB-309-CI19-0-1-DUP	SB-310-CI19-0-1	SB-310-CI19-1-3	SB-311-CI19-0-1	SB-311-CI19-1-3	SB-312-CI19-0-1
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO Metals	Aluminum	7429-90-5	mg/kg	6470 J	4610	5570	4650	7930	6580	7090
RA SO Metals	Antimony	7440-36-0	mg/kg	0.0410 J	0.0520 J	0.110	0.0850	0.133	0.164	0.0980
RA SO Metals	Arsenic	7440-38-2	mg/kg	1.78	1.60	2.65	2.13	1.62	1.93	1.91
RA SO Metals	Barium	7440-39-3	mg/kg	12.8	15.6	13.0	22.0	52.0	15.7	14.5
RA SO Metals	Beryllium	7440-41-7	mg/kg	0.476	0.414	0.671	0.554	0.508	0.473	0.502
RA SO Metals	Cadmium	7440-43-9	mg/kg	0.0829	1.03	0.730	0.175	1.12	0.646	0.173
RA SO Metals	Calcium	7440-70-2	mg/kg	497 J	368	546	664	26600	600	377
RA SO Metals	Chromium	7440-47-3	mg/kg	9.68 J	7.20 J	6.74	8.38	11.8	8.79	7.64
RA SO Metals	Cobalt	7440-48-4	mg/kg	3.40 J	4.56	3.94	3.54	2.53	1.98	2.35
RA SO Metals	Copper	7440-50-8	mg/kg	8.94 J	7.33	8.50	7.95	9.84	10.1	9.43
RA SO Metals	Iron	7439-89-6	mg/kg	10300	7180	9210	9200	7620	7590	8410
RA SO Metals	Lead	7439-92-1	mg/kg	11.6 J	15.6	12.7	18.1	43.1	167	52.7
RA SO Metals	Magnesium	7439-95-4	mg/kg	1690 J	844 J	1010	967	2080	1010	1120
RA SO Metals	Manganese	7439-96-5	mg/kg	115 J	93.8	92.9	115	131	79.2	92.2
RA SO Metals	Mercury	7439-97-6	mg/kg	0.0100 J	0.0170 J	0.0110 J	0.0130 J	0.0160 J	0.0210 J	0.0220 J
RA SO Metals	Nickel	7440-02-0	mg/kg	6.67 J	4.32	5.40	5.88	6.23	5.35	5.51
RA SO Metals	Potassium	7440-09-7	mg/kg	629 J	365	422	330	549	415	429
RA SO Metals	Selenium	7782-49-2	mg/kg	0.120 J	0.140 J	0.460	0.260 J	0.120 J	0.150 J	0.190 J
RA SO Metals	Silver	7440-22-4	mg/kg	0.0220 J	0.0370 J	0.0698 J	0.0578 J	0.125	0.0824	0.0849
RA SO Metals	Sodium	7440-23-5	mg/kg	27.9 J	22.7 J	27.1 J	24.4 J	55.4 J	31.6 J	33.6 J
RA SO Metals	Thallium	7440-28-0	mg/kg	0.0926	0.0650 J	0.0896	0.0670 J	0.0745	0.0825	0.0918
RA SO Metals	Vanadium	7440-62-2	mg/kg	10.6	6.48	7.69	7.35	10.7	12.8	11.8
RA SO Metals	Zinc	7440-66-6	mg/kg	27.4 J	78.5	42.3	40.8	59.6	79.7	49.6
RA SO Other	Total Organic Carbon	TOC	mg/kg	22000 J	7300 J					17000 J
RA SO Pest PCBs	Aroclor 1016	12674-11-2	mg/kg							
RA SO Pest PCBs	Aroclor 1221	11104-28-2	mg/kg							
RA SO Pest PCBs	Aroclor 1232	11141-16-5	mg/kg							
RA SO Pest PCBs	Aroclor 1242	53469-21-9	mg/kg							
RA SO Pest PCBs	Aroclor 1248	12672-29-6	mg/kg							
RA SO Pest PCBs	Aroclor 1254	11097-69-1	mg/kg							
RA SO Pest PCBs	Aroclor 1260	11096-82-5	mg/kg							
RA SO Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg							
RA SO Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg							
RA SO SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg	0.00330 J	0.00270 J	0.0410	0.0170 J	0.00530 J	0.00470 J	0.00440 J
RA SO SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg	0.65 U	0.63 U	0.65 U	0.65 U		0.66 U	0.66 U
RA SO SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U		0.27 U	0.26 U
RA SO SVOCs EPHs	2,4-Dichlorophenol	120-83-2	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U		0.27 U	0.26 U
RA SO SVOCs EPHs	2,4-Dimethylphenol	105-67-9	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U		0.27 U	0.26 U
RA SO SVOCs EPHs	2,4-Dinitrophenol	51-28-5	mg/kg	0.65 U	0.63 U	0.65 U	0.65 U		0.66 U	0.66 U
RA SO SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	2-Chloronaphthalene	91-58-7	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	2-Chlorophenol	95-57-8	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U		0.27 U	0.26 U
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.00620 J	0.00340 J	0.0680	0.0180 J	0.00640 J	0.00670 J	0.00600 J
RA SO SVOCs EPHs	2-Methylphenol	95-48-7	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U		0.27 U	0.26 U
RA SO SVOCs EPHs	2-Nitroaniline	88-74-4	mg/kg	0.65 U	0.63 U	0.65 U	0.65 U	0.66 U	0.66 U	0.66 U
RA SO SVOCs EPHs	2-Nitrophenol	88-75-5	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U		0.27 U	0.26 U
RA SO SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U		0.27 U	0.26 U
RA SO SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	3-Nitroaniline	99-09-2	mg/kg	0.65 U	0.63 U	0.65 U	0.65 U	0.66 U	0.66 U	0.66 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-309	SB-309	SB-310	SB-310	SB-311	SB-311	SB-312
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	SB-309-CI19-1-3	SB-309-CI19-0-1-DUP	SB-310-CI19-0-1	SB-310-CI19-1-3	SB-311-CI19-0-1	SB-311-CI19-1-3	SB-312-CI19-0-1
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO SVOCs EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	0.65 U	0.63 U	0.65 U	0.65 U		0.66 U	0.66 U
RA SO SVOCs EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U		0.27 U	0.26 U
RA SO SVOCs EPHs	4-Chloroaniline	106-47-8	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	4-Nitroaniline	100-01-6	mg/kg	0.65 U	0.63 U	0.65 U	0.65 U	0.66 U	0.66 U	0.66 U
RA SO SVOCs EPHs	4-Nitrophenol	100-02-7	mg/kg	0.65 U	0.63 U	0.65 U	0.65 U		0.66 U	0.66 U
RA SO SVOCs EPHs	Acenaphthene	83-32-9	mg/kg	0.01 U	0.01 U	0.01 U	0.011 U	0.0240	0.011 U	0.00980 J
RA SO SVOCs EPHs	Acenaphthylene	208-96-8	mg/kg	0.01 U	0.01 U	0.01 U	0.011 U	0.011 U	0.011 U	0.011 U
RA SO SVOCs EPHs	Anthracene	120-12-7	mg/kg	0.0150 J	0.01 UJ	0.00140 J	0.00700 J	0.0280 J	0.00360 J	0.0110 J
RA SO SVOCs EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.0720	0.0220	0.01 U	0.0460	0.4	0.0300	0.0640
RA SO SVOCs EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.0760	0.0240	0.00950 J	0.0480	0.5	0.0300	0.0540
RA SO SVOCs EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.0760	0.0370	0.0130 J	0.11	0.8	0.0720	0.12
RA SO SVOCs EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.01 U	0.0140 J	0.01 U	0.0320	0.36	0.0210 J	0.0370
RA SO SVOCs EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.0520	0.0210	0.0120 J	0.0200 J	0.27	0.0130 J	0.0330
RA SO SVOCs EPHs	Benzoic acid	65-85-0	mg/kg	0.65 U	0.63 U	0.65 U	0.65 U		0.66 U	0.66 U
RA SO SVOCs EPHs	Benzyl Alcohol	100-51-6	mg/kg	0.52 U	0.51 U	0.52 U	0.52 U	0.53 U	0.53 U	0.53 U
RA SO SVOCs EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg							
RA SO SVOCs EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg							
RA SO SVOCs EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg							
RA SO SVOCs EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg							
RA SO SVOCs EPHs	Carbazole	86-74-8	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Chrysene	218-01-9	mg/kg	0.1	0.0260	0.0140 J	0.0630	0.47	0.0300	0.0720
RA SO SVOCs EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.01 U	0.00460 J	0.01 U	0.0140 J	0.13	0.00630 J	0.0130 J
RA SO SVOCs EPHs	Dibenzofuran	132-64-9	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Diethyl Phthalate	84-66-2	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Dimethyl Phthalate	131-11-3	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Fluoranthene	206-44-0	mg/kg	0.0820	0.0250	0.01 U	0.0690	0.44	0.0420	0.12
RA SO SVOCs EPHs	Fluorene	86-73-7	mg/kg	0.00450 J	0.01 U	0.00390 J	0.00610 J	0.0140 J	0.011 U	0.00800 J
RA SO SVOCs EPHs	Hexachlorobenzene	118-74-1	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Hexachloroethane	67-72-1	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.01 U	0.01 U	0.01 U	0.011 U	0.39	0.011 U	0.0360
RA SO SVOCs EPHs	Isophorone	78-59-1	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Naphthalene	91-20-3	mg/kg	0.01 U	0.01 U	0.0410	0.0120 J	0.0120 J	0.011 U	0.0120 J
RA SO SVOCs EPHs	Nitrobenzene	98-95-3	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U	0.27 U	0.27 U	0.26 U
RA SO SVOCs EPHs	Pentachlorophenol	87-86-5	mg/kg	0.65 U	0.63 U	0.65 U	0.65 U		0.66 U	0.66 U
RA SO SVOCs EPHs	Phenanthrene	85-01-8	mg/kg	0.0660	0.00800 J	0.0240	0.0870	0.2	0.0340	0.11
RA SO SVOCs EPHs	Phenol	108-95-2	mg/kg	0.26 U	0.26 U	0.26 U	0.26 U		0.27 U	0.26 U
RA SO SVOCs EPHs	Pyrene	129-00-0	mg/kg	0.0870	0.0150 J	0.0110 J	0.0830	0.6	0.0480	0.14
RA SO SVOCs EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	0.58	0.19	0.11	0.50	4.4	0.30	0.69
RA SO SVOCs EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.11	0.038	0.18	0.16	0.30	0.069	0.17
RA SO SVOCs EPHs	Total PAHs (b)	Tot-PAH	mg/kg	0.67	0.23	0.27	0.65	4.7	0.37	0.86
RA SO VOCs VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA SO VOCs VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-309	SB-309	SB-310	SB-310	SB-311	SB-311	SB-312
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	SB-309-CI19-1-3	SB-309-CI19-0-1-DUP	SB-310-CI19-0-1	SB-310-CI19-1-3	SB-311-CI19-0-1	SB-311-CI19-1-3	SB-312-CI19-0-1
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.000410 J	0.0023 U
RA_SO_VOCs_VPHs	1,4-Dioxane	123-91-1	mg/kg							
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg	0.011 U	0.012 U	0.012 U	0.012 UJ	0.012 UJ	0.011 U	0.012 U
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg	0.011 U	0.012 U	0.012 U	0.012 UJ	0.012 UJ	0.011 U	0.012 U
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.011 U	0.012 U	0.012 U	0.012 UJ	0.012 UJ	0.011 U	0.012 U
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg	0.011 U	0.012 U	0.0190 J	0.0200 J	0.12 J	0.011 U	0.0890
RA_SO_VOCs_VPHs	Acrylonitrile	107-13-1	mg/kg							
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg	0.0044 U	0.0048 U	0.005 U	0.0048 UJ	0.0049 UJ	0.0042 U	0.0046 U
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg							
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg							
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg							
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.000820 J	0.000780 J	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg	0.0044 U	0.0048 U	0.005 U	0.0048 UJ	0.0049 UJ	0.0042 U	0.0046 U
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg	0.0044 U	0.0048 U	0.005 U	0.0048 UJ	0.0049 UJ	0.0042 U	0.0046 U
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0044 U	0.0048 U	0.005 U	0.0048 UJ	0.0049 UJ	0.0042 U	0.0046 U
RA_SO_VOCs_VPHs	Diethylether	60-29-7	mg/kg							
RA_SO_VOCs_VPHs	Diisopropyl Ether	108-20-3	mg/kg							
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Freon 113	76-13-1	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-309	SB-309	SB-310	SB-310	SB-311	SB-311	SB-312
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	SB-309-CI19-1-3	SB-309-CI19-0-1-DUP	SB-310-CI19-0-1	SB-310-CI19-1-3	SB-311-CI19-0-1	SB-311-CI19-1-3	SB-312-CI19-0-1
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	0.0044 U	0.0048 U	0.005 U	0.0048 UJ	0.0049 UJ	0.0042 U	0.0046 U
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg	0.011 U	0.012 U	0.012 U	0.012 UJ	0.012 UJ	0.011 U	0.012 U
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg							
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg							
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg							
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg							
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg	0.00170 J	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg	0.011 U	0.012 U	0.012 U	0.012 UJ	0.012 UJ	0.011 U	0.012 U
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.0022 U	0.00200 J	0.00150 J	0.0024 UJ	0.00380 J	0.00120 J	0.00220 J
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg	0.0065 U	0.0072 U	0.0075 U	0.0071 UJ	0.0074 UJ	0.0064 U	0.0069 U
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.0066 U	0.0072 U	0.0075 U	0.0072 U	0.0073 U	0.0063 U	0.0069 U
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0022 U	0.0024 U	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg							
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg	0.00720	0.000650 J	0.0025 U	0.0024 UJ	0.0024 UJ	0.0021 U	0.0023 U
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg	0.0044 U	0.0048 U	0.005 U	0.0048 UJ	0.0049 UJ	0.0042 U	0.0046 U
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg	0.0044 U	0.0048 U	0.005 U	0.0048 UJ	0.0049 UJ	0.0042 U	0.0046 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-312	SB-313	SB-313	SB-314	SB-314	SB-315	SB-315
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-312-CI19-1-3	SB-313-CI19-0-1	SB-313-CI19-1-3	SB-314-CI19-0-1	SB-314-CI19-1-3	SB-315-CI19-0-1	SB-315-CI19-1-3
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO Metals	Aluminum	7429-90-5	mg/kg	5250	2810	8870	5600	4450	7460	6100
RA SO Metals	Antimony	7440-36-0	mg/kg	0.0490 J	0.0700	0.100	0.0720 J	0.0560 J	0.0970	0.0260 J
RA SO Metals	Arsenic	7440-38-2	mg/kg	1.25	1.35	2.60	2.18	1.66	2.56	1.44
RA SO Metals	Barium	7440-39-3	mg/kg	15.0	11.1	10.5	6.09	10.6	17.5	13.1
RA SO Metals	Beryllium	7440-41-7	mg/kg	0.431	0.322	0.489	0.527	0.339	0.453	0.561
RA SO Metals	Cadmium	7440-43-9	mg/kg	0.699	0.263	0.0570 J	0.292	0.226	0.181	0.0992
RA SO Metals	Calcium	7440-70-2	mg/kg	304	484	592	444	430	370	267
RA SO Metals	Chromium	7440-47-3	mg/kg	2.98	3.53	7.80	9.20	3.80	13.1	4.74
RA SO Metals	Cobalt	7440-48-4	mg/kg	0.992	1.30	2.91	3.23	1.42	3.19	2.85
RA SO Metals	Copper	7440-50-8	mg/kg	3.29	5.50	5.83	10.4	13.2	9.82	5.07
RA SO Metals	Iron	7439-89-6	mg/kg	5780	4240	8980	8270	5760	10700	9040
RA SO Metals	Lead	7439-92-1	mg/kg	12.0	219	16.0	55.1	939	67.9	5.72
RA SO Metals	Magnesium	7439-95-4	mg/kg	371	526	1450	1100	517	1220	830
RA SO Metals	Manganese	7439-96-5	mg/kg	77.6	54.6	93.6	112	64.2	117	252
RA SO Metals	Mercury	7439-97-6	mg/kg	0.017 U	0.014 U	0.016 U	0.0450	0.017 U	0.015 U	0.015 U
RA SO Metals	Nickel	7440-02-0	mg/kg	2.37	2.65	5.27	6.07	2.80	8.29	4.45
RA SO Metals	Potassium	7440-09-7	mg/kg	268	229	457	450	234	404	505
RA SO Metals	Selenium	7782-49-2	mg/kg	0.150 J	0.0990 J	0.280 J	0.140 J	0.110 J	0.254 J	0.160 J
RA SO Metals	Silver	7440-22-4	mg/kg	0.0220 J	0.0489 J	0.0310 J	0.0430 J	0.0370 J	0.109	0.0330 J
RA SO Metals	Sodium	7440-23-5	mg/kg	26.1 J	26.2 J	41.7 J	34.4 J	24.5 J	38.6 J	30.6 J
RA SO Metals	Thallium	7440-28-0	mg/kg	0.0580 J	0.0330 J	0.0790 J	0.0735 J	0.0460 J	0.100	0.110
RA SO Metals	Vanadium	7440-62-2	mg/kg	5.64	6.27	11.4	9.84	6.57	13.4	7.66
RA SO Metals	Zinc	7440-66-6	mg/kg	41.2	75.6	75.8	54.0	38.1	35.3	33.4
RA SO Other	Total Organic Carbon	TOC	mg/kg	7500 J			9500 J	7400 J		
RA SO Pest PCBs	Aroclor 1016	12674-11-2	mg/kg							
RA SO Pest PCBs	Aroclor 1221	11104-28-2	mg/kg							
RA SO Pest PCBs	Aroclor 1232	11141-16-5	mg/kg							
RA SO Pest PCBs	Aroclor 1242	53469-21-9	mg/kg							
RA SO Pest PCBs	Aroclor 1248	12672-29-6	mg/kg							
RA SO Pest PCBs	Aroclor 1254	11097-69-1	mg/kg							
RA SO Pest PCBs	Aroclor 1260	11096-82-5	mg/kg							
RA SO Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg							
RA SO Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg							
RA SO SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.00380 J	0.01 U
RA SO SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg	0.65 U	0.63 U	0.63 U	0.64 U	0.64 U	0.62 U	0.63 U
RA SO SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	2,4-Dichlorophenol	120-83-2	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	2,4-Dimethylphenol	105-67-9	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	2,4-Dinitrophenol	51-28-5	mg/kg	0.65 U	0.63 U	0.63 U	0.64 U	0.64 U	0.62 U	0.63 U
RA SO SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	2-Chloronaphthalene	91-58-7	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	2-Chlorophenol	95-57-8	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.00740 J	0.01 U
RA SO SVOCs EPHs	2-Methylphenol	95-48-7	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	2-Nitroaniline	88-74-4	mg/kg	0.65 U	0.63 U	0.63 U	0.64 U	0.64 U	0.62 U	0.63 U
RA SO SVOCs EPHs	2-Nitrophenol	88-75-5	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA SO SVOCs EPHs	3-Nitroaniline	99-09-2	mg/kg	0.65 U	0.63 U	0.63 U	0.64 U	0.64 U	0.62 U	0.63 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-312	SB-313	SB-313	SB-314	SB-314	SB-315	SB-315
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-312-CI19-1-3	SB-313-CI19-0-1	SB-313-CI19-1-3	SB-314-CI19-0-1	SB-314-CI19-1-3	SB-315-CI19-0-1	SB-315-CI19-1-3
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	0.65 U	0.63 U	0.63 U	0.64 U	0.64 U	0.62 U	0.63 U
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg	0.65 U	0.63 U	0.63 U	0.64 U	0.64 U	0.62 U	0.63 U
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg	0.65 U	0.63 U	0.63 U	0.64 U	0.64 U	0.62 U	0.63 U
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg	0.011 U	0.00820 J	0.01 U	0.00440 J	0.00160 J	0.00500 J	0.01 U
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.011 U	0.0690	0.01 U	0.0380	0.01 U	0.0410	0.01 U
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.00390 J	0.0790	0.01 U	0.0490	0.00960 J	0.0440	0.01 U
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.011 U	0.12	0.00340 J	0.0770	0.0160 J	0.0780	0.01 U
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.011 U	0.0580	0.01 U	0.0270	0.00330 J	0.0360	0.01 U
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.011 U	0.0520	0.01 U	0.0350	0.00800 J	0.0320	0.01 U
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg	0.65 UJ	0.63 UJ	0.63 UJ	0.64 UJ	0.64 UJ	0.62 UJ	0.63 UJ
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg	0.53 U	0.51 U	0.5 U	0.51 U	0.51 U	0.5 U	0.51 U
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.15 J	0.25 U
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg							
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg							
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg							
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg							
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg	0.011 U	0.0860	0.00300 J	0.0500	0.0130 J	0.0550	0.01 U
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.011 U	0.0180 J	0.01 U	0.00960 J	0.00220 J	0.0110 J	0.01 U
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg	0.011 U	0.13	0.00300 J	0.0820	0.0260	0.0780	0.01 U
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0160 J	0.01 U
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.011 U	0.0390	0.00510 J	0.0270	0.00940 J	0.0280	0.01 U
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg	0.011 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg	0.65 U	0.63 U	0.63 U	0.64 U	0.64 U	0.62 U	0.63 U
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg	0.011 U	0.0600	0.00210 J	0.0360	0.0130 J	0.0550	0.01 U
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.25 U	0.25 U
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg	0.011 U	0.11	0.00280 J	0.0680	0.0170 J	0.0860	0.01 U
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	0.10	0.76	0.035	0.46	0.11	0.49	0.10 U
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.088 U	0.12	0.072	0.067	0.024	0.10	0.080 U
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg	0.19	0.88	0.058	0.55	0.16	0.59	0.18 U
RA_SO_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-312	SB-313	SB-313	SB-314	SB-314	SB-315	SB-315
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-312-CI19-1-3	SB-313-CI19-0-1	SB-313-CI19-1-3	SB-314-CI19-0-1	SB-314-CI19-1-3	SB-315-CI19-0-1	SB-315-CI19-1-3
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	1,4-Dioxane	123-91-1	mg/kg							
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.011 UJ	0.012 U
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.011 UJ	0.012 U
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.000680 J	0.0023 U
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.011 UJ	0.012 U
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg	0.012 U	0.0110 J	0.0400	0.0290	0.012 U	0.011 UJ	0.012 U
RA_SO_VOCs_VPHs	Acrylonitrile	107-13-1	mg/kg							
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg	0.0048 U	0.005 U	0.005 U	0.0048 U	0.0048 U	0.0045 UJ	0.0046 U
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg							
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg							
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg							
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg	0.0048 U	0.005 U	0.005 U	0.0048 U	0.0048 U	0.0045 UJ	0.0046 U
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg	0.0048 U	0.005 U	0.005 U	0.0048 U	0.0048 U	0.0045 UJ	0.0046 U
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0048 U	0.005 U	0.005 U	0.0048 U	0.0048 U	0.0045 UJ	0.0046 U
RA_SO_VOCs_VPHs	Diethylether	60-29-7	mg/kg							
RA_SO_VOCs_VPHs	Diisopropyl Ether	108-20-3	mg/kg							
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Freon 113	76-13-1	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-312	SB-313	SB-313	SB-314	SB-314	SB-315	SB-315
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-312-CI19-1-3	SB-313-CI19-0-1	SB-313-CI19-1-3	SB-314-CI19-0-1	SB-314-CI19-1-3	SB-315-CI19-0-1	SB-315-CI19-1-3
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	0.0048 U	0.005 U	0.005 U	0.0048 U	0.0048 U	0.0045 UJ	0.0046 U
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.011 UJ	0.012 U
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg							
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg							
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg							
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg							
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.011 UJ	0.012 U
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.00140 J	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg	0.0071 U	0.0075 U	0.0074 U	0.0072 U	0.0072 U	0.0068 UJ	0.007 U
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.0072 U	0.0075 U	0.0075 U	0.0072 U	0.0072 U	0.0067 U	0.0069 U
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg							
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg	0.0024 U	0.0025 U	0.0025 U	0.0024 U	0.0024 U	0.0022 UJ	0.0023 U
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg	0.0048 U	0.005 U	0.005 U	0.0048 U	0.0048 U	0.0045 UJ	0.0046 U
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg	0.0048 U	0.005 U	0.005 U	0.0048 U	0.0048 U	0.0045 UJ	0.0046 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-316	SB-316	SB-317	SB-317	SB-318	SB-318	SB-319
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-316-CI19-0-1	SB-316-CI19-1-3	SB-317-CI19-0-1	SB-317-CI19-1-3	SB-318-CI19-0-1	SB-318-CI19-1-3	SB-319-CI19-0-1
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO Metals	Aluminum	7429-90-5	mg/kg	9960	6020	8160	3900	7680	2500	11900
RA SO Metals	Antimony	7440-36-0	mg/kg	0.0600 J	0.0350 J	0.120	0.0170 J	0.0520 J	0.038 U	0.0790
RA SO Metals	Arsenic	7440-38-2	mg/kg	1.75	1.17	2.56	0.902	1.34	0.850	2.47
RA SO Metals	Barium	7440-39-3	mg/kg	12.7	7.69	14.0	8.01	14.0	5.08	17.9
RA SO Metals	Beryllium	7440-41-7	mg/kg	0.563	0.439	0.469	0.791	0.483	0.274	0.536
RA SO Metals	Cadmium	7440-43-9	mg/kg	0.0160 J	0.0200 J	0.161	0.120	0.0885	0.0280 J	0.171
RA SO Metals	Calcium	7440-70-2	mg/kg	287	215 J	420	251	216	278	1030
RA SO Metals	Chromium	7440-47-3	mg/kg	7.52	4.61	9.04	2.42	5.69	1.94	8.43
RA SO Metals	Cobalt	7440-48-4	mg/kg	2.54	2.24	3.43	2.01	1.64	1.82	1.71
RA SO Metals	Copper	7440-50-8	mg/kg	9.42	5.34	8.49	4.12	5.09	2.66	5.09
RA SO Metals	Iron	7439-89-6	mg/kg	14600	7010	11000	6520	7850	4310	9740
RA SO Metals	Lead	7439-92-1	mg/kg	7.10	4.77	30.8	4.94	13.0	2.40	18.5
RA SO Metals	Magnesium	7439-95-4	mg/kg	1690	953 J	1480	784	801	389	1020
RA SO Metals	Manganese	7439-96-5	mg/kg	77.4	56.5 J	149	173	82.1	50.0	82.1
RA SO Metals	Mercury	7439-97-6	mg/kg	0.016 U	0.015 U	0.016 U	0.014 U	0.015 U	0.017 U	0.0360
RA SO Metals	Nickel	7440-02-0	mg/kg	6.07	4.29 J	7.28	3.63	4.18	2.38	4.34
RA SO Metals	Potassium	7440-09-7	mg/kg	336	320	522	409	248	236	662
RA SO Metals	Selenium	7782-49-2	mg/kg	0.408	0.0860 J	0.220 J	0.0580 J	0.230 J	0.0420 J	0.396
RA SO Metals	Silver	7440-22-4	mg/kg	0.0320 J	0.0170 J	0.0874	0.0140 J	0.0430 J	0.00640 J	0.0730
RA SO Metals	Sodium	7440-23-5	mg/kg	25.3 J	19.9 J	60.8 J	31.9 J	25.0 J	18.0 J	80.2
RA SO Metals	Thallium	7440-28-0	mg/kg	0.0918	0.0625	0.111	0.0835	0.0760 J	0.0340 J	0.125
RA SO Metals	Vanadium	7440-62-2	mg/kg	11.5	6.08	13.6	3.29	8.70	3.53	15.5
RA SO Metals	Zinc	7440-66-6	mg/kg	33.5	21.2	32.7	39.4	29.4	14.9	30.2
RA SO Other	Total Organic Carbon	TOC	mg/kg	6500 J	5500 J	20000 J	2900 J			20000 J
RA SO Pest PCBs	Aroclor 1016	12674-11-2	mg/kg							
RA SO Pest PCBs	Aroclor 1221	11104-28-2	mg/kg							
RA SO Pest PCBs	Aroclor 1232	11141-16-5	mg/kg							
RA SO Pest PCBs	Aroclor 1242	53469-21-9	mg/kg							
RA SO Pest PCBs	Aroclor 1248	12672-29-6	mg/kg							
RA SO Pest PCBs	Aroclor 1254	11097-69-1	mg/kg							
RA SO Pest PCBs	Aroclor 1260	11096-82-5	mg/kg							
RA SO Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg							
RA SO Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg							
RA SO SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0095 U
RA SO SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg	0.64 U	0.64 U	0.64 U	0.62 U	0.64 U	0.65 U	0.58 U
RA SO SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	2,4-Dichlorophenol	120-83-2	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	2,4-Dimethylphenol	105-67-9	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	2,4-Dinitrophenol	51-28-5	mg/kg	0.64 U	0.64 U	0.64 U	0.62 U	0.64 U	0.65 U	0.58 U
RA SO SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	2-Chloronaphthalene	91-58-7	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	2-Chlorophenol	95-57-8	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.01 U	0.01 U	0.00560 J	0.01 U	0.01 U	0.01 U	0.00310 J
RA SO SVOCs EPHs	2-Methylphenol	95-48-7	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	2-Nitroaniline	88-74-4	mg/kg	0.64 U	0.64 U	0.64 U	0.62 U	0.64 U	0.65 U	0.58 U
RA SO SVOCs EPHs	2-Nitrophenol	88-75-5	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA SO SVOCs EPHs	3-Nitroaniline	99-09-2	mg/kg	0.64 U	0.64 U	0.64 U	0.62 U	0.64 U	0.65 U	0.58 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-316	SB-316	SB-317	SB-317	SB-318	SB-318	SB-319
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-316-CI19-0-1	SB-316-CI19-1-3	SB-317-CI19-0-1	SB-317-CI19-1-3	SB-318-CI19-0-1	SB-318-CI19-1-3	SB-319-CI19-0-1
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	0.64 U	0.64 U	0.64 U	0.62 U	0.64 U	0.65 U	0.58 U
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg	0.64 U	0.64 U	0.64 U	0.62 U	0.64 U	0.65 U	0.58 U
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg	0.64 U	0.64 U	0.64 U	0.62 U	0.64 U	0.65 U	0.58 U
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0095 U
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0095 U
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg	0.01 U	0.01 U	0.00940 J	0.01 U	0.01 U	0.01 U	0.00240 J
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.01 U	0.01 U	0.0610	0.01 U	0.00320 J	0.01 U	0.0240
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.01 U	0.01 U	0.0480	0.01 U	0.00380 J	0.01 U	0.0280
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.00550 J	0.01 U	0.1	0.01 U	0.00710 J	0.01 U	0.0460
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.01 U	0.01 U	0.0310	0.01 U	0.00560 J	0.01 U	0.0210
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.01 U	0.01 U	0.0460	0.01 U	0.00440 J	0.01 U	0.0160 J
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg	0.64 UJ	0.64 UJ	0.64 UJ	0.62 UJ	0.64 UJ	0.65 UJ	0.58 UJ
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg	0.52 U	0.51 U	0.51 U	0.5 U	0.52 U	0.52 U	0.47 U
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg							
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg							
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg							
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg							
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg	0.00310 J	0.01 U	0.0600	0.01 U	0.00450 J	0.01 U	0.0270
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.01 U	0.01 U	0.0120 J	0.01 U	0.00270 J	0.01 U	0.00520 J
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg	0.00310 J	0.01 U	0.13	0.01 U	0.00570 J	0.01 U	0.0390
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg	0.01 U	0.01 U	0.00580 J	0.01 U	0.01 U	0.01 U	0.0095 U
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.00610 J	0.01 U	0.0400	0.01 U	0.01 U	0.01 U	0.0240
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg	0.01 U	0.01 U	0.00640 J	0.01 U	0.01 U	0.01 U	0.00280 J
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg	0.64 U	0.64 U	0.64 U	0.62 U	0.64 U	0.65 U	0.58 U
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg	0.00220 J	0.01 U	0.0880	0.01 U	0.00250 J	0.01 U	0.0150 J
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg	0.26 U	0.26 U	0.26 U	0.25 U	0.26 U	0.26 U	0.24 U
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg	0.00260 J	0.01 U	0.11	0.01 U	0.00780 J	0.01 U	0.0430
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	0.041	0.10 U	0.64	0.10 U	0.050	0.10 U	0.27
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.072	0.080 U	0.14	0.080 U	0.073	0.080 U	0.034
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg	0.068	0.18 U	0.77	0.18 U	0.085	0.18 U	0.31
RA_SO_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-316	SB-316	SB-317	SB-317	SB-318	SB-318	SB-319
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-316-CI19-0-1	SB-316-CI19-1-3	SB-317-CI19-0-1	SB-317-CI19-1-3	SB-318-CI19-0-1	SB-318-CI19-1-3	SB-319-CI19-0-1
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0022 U	0.0025 UJ	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0022 U	0.0025 UJ	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0022 U	0.0025 UJ	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0022 U	0.0025 UJ	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	1,4-Dioxane	123-91-1	mg/kg							
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg	0.011 U	0.012 U	0.011 U	0.011 U	0.012 U	0.012 U	0.0099 U
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg	0.0022 U	0.0025 UJ	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg	0.011 U	0.012 U	0.011 U	0.011 U	0.012 U	0.012 U	0.0099 U
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg	0.0022 U	0.0025 UJ	0.00120 J	0.0023 U	0.0024 U	0.0025 U	0.000910 J
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.011 U	0.012 U	0.011 U	0.011 U	0.012 U	0.012 U	0.0099 U
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg	0.011 U	0.012 UJ	0.011 U	0.011 U	0.0910	0.012 U	0.0099 U
RA_SO_VOCs_VPHs	Acrylonitrile	107-13-1	mg/kg							
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg	0.0045 U	0.005 U	0.0044 U	0.0046 U	0.0048 U	0.005 U	0.004 U
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg							
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg							
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg							
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg	0.0045 U		0.0044 U	0.0046 U	0.0048 U	0.005 U	0.004 U
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg	0.0045 U	0.005 U	0.0044 U	0.0046 U	0.0048 U	0.005 U	0.004 U
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0045 U	0.005 U	0.0044 U	0.0046 U	0.0048 U	0.005 U	0.004 U
RA_SO_VOCs_VPHs	Diethylether	60-29-7	mg/kg							
RA_SO_VOCs_VPHs	Diisopropyl Ether	108-20-3	mg/kg							
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Freon 113	76-13-1	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-316	SB-316	SB-317	SB-317	SB-318	SB-318	SB-319
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-316-CI19-0-1	SB-316-CI19-1-3	SB-317-CI19-0-1	SB-317-CI19-1-3	SB-318-CI19-0-1	SB-318-CI19-1-3	SB-319-CI19-0-1
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	0.0045 U	0.005 UJ	0.0044 U	0.0046 U	0.0048 U	0.005 U	0.004 U
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg	0.011 U	0.012 U	0.011 U	0.011 U	0.012 U	0.012 U	0.0099 U
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg							
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg	0.0022 U	0.0025 UJ	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg	0.0022 U	0.0025 UJ	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg	0.0022 U	0.0025 UJ	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg							
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg							
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg	0.0022 U	0.0025 UJ	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg							
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg	0.011 U	0.012 U	0.011 U	0.011 U	0.012 U	0.012 U	0.0099 U
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.00190 J	0.0025 U	0.00130 J	0.00350 J	0.00380 J	0.00390 J	0.002 U
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg	0.0068 U	0.0074 UJ	0.0066 U	0.0068 U	0.0072 U	0.0075 U	0.0059 U
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.0067 U	0.0075 U	0.0066 U	0.0069 U	0.0072 U	0.0075 U	0.0060 U
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.002 U
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg							
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg	0.0022 U	0.0025 U	0.0022 U	0.0023 U	0.0024 U	0.0025 U	0.00290 J
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg	0.0045 U	0.005 U	0.0044 U	0.0046 U	0.0048 U	0.005 U	0.004 U
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg	0.0045 U	0.005 U	0.0044 U	0.0046 U	0.0048 U	0.005 U	0.004 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-319	SB-320	SB-320	SB-321	SB-321	SB-322	SB-322
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-319-CI19-1-3	SB-320-CI19-0-1	SB-320-CI19-1-3	SB-321-CI19-0-1	SB-321-CI19-1-3	SB-322-CI19-0-1	SB-322-CI19-1-3
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_Metals	Aluminum	7429-90-5	mg/kg	5240	6780	7150	4680	4170	4140	7640
RA_SO_Metals	Antimony	7440-36-0	mg/kg	0.110	0.172	0.0430 J	0.447	0.170	0.197	1.12
RA_SO_Metals	Arsenic	7440-38-2	mg/kg	2.45	3.40	1.44	1.71	1.44	1.91	8.02
RA_SO_Metals	Barium	7440-39-3	mg/kg	14.2	20.7	10.7	23.9	10.5	16.2	34.8
RA_SO_Metals	Beryllium	7440-41-7	mg/kg	0.508	0.535	0.384	4.42	0.410	0.346	0.504
RA_SO_Metals	Cadmium	7440-43-9	mg/kg	0.167	0.565	0.230	0.292	2.46	1.13	4.22
RA_SO_Metals	Calcium	7440-70-2	mg/kg	662	671	370	742	499	360	798
RA_SO_Metals	Chromium	7440-47-3	mg/kg	12.0	7.63	5.28	32.2	6.71	7.64	29.1
RA_SO_Metals	Cobalt	7440-48-4	mg/kg	3.54	3.16	1.53	7.57	1.98	1.40	2.41
RA_SO_Metals	Copper	7440-50-8	mg/kg	16.9	8.96	4.57	116	6.52	8.72	17.3
RA_SO_Metals	Iron	7439-89-6	mg/kg	10200	8720	6990	14300	6200	6420	8810
RA_SO_Metals	Lead	7439-92-1	mg/kg	54.6	41.1	5.18	159	31.8	128	140
RA_SO_Metals	Magnesium	7439-95-4	mg/kg	1210	1340	762	827	729	675	1010
RA_SO_Metals	Manganese	7439-96-5	mg/kg	124	117	51.4	148	84.3	59.8	107
RA_SO_Metals	Mercury	7439-97-6	mg/kg	0.018 U	0.017 U	0.017 U	0.0574	0.0513	0.0210 J	0.0310 J
RA_SO_Metals	Nickel	7440-02-0	mg/kg	9.73	5.73	3.97	67.7	3.70	3.26	5.33
RA_SO_Metals	Potassium	7440-09-7	mg/kg	514	574	234	404	355	378	421
RA_SO_Metals	Selenium	7782-49-2	mg/kg	0.160 J	0.180 J	0.170 J	0.280 J	0.0810 J	0.110 J	0.250 J
RA_SO_Metals	Silver	7440-22-4	mg/kg	0.442	0.0581 J	0.0240 J	0.145	0.0562	0.242	4.94
RA_SO_Metals	Sodium	7440-23-5	mg/kg	44.9 J	31.8 J	22.8 J	83.4	26.7 J	40.5 J	65.4 J
RA_SO_Metals	Thallium	7440-28-0	mg/kg	0.0708	0.102	0.0641	0.0510 J	0.0533 J	0.0540 J	0.0886
RA_SO_Metals	Vanadium	7440-62-2	mg/kg	11.1	9.86	8.58	7.28	5.97	7.27	10.1
RA_SO_Metals	Zinc	7440-66-6	mg/kg	43.4	40.8	16.8	425	33.5	36.1	72.0
RA_SO_Other	Total Organic Carbon	TOC	mg/kg	11000 J					28000 J	12000 J
RA_SO_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg							
RA_SO_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg							
RA_SO_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg							
RA_SO_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg							
RA_SO_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	1-Methylnaphthalene	90-12-0	mg/kg	0.00410 J	0.01 U	0.01 U	0.0087 U	0.01 U	0.0240	0.00170 J
RA_SO_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg	0.58 U	0.62 U	0.61 U	0.53 U	0.63 U	0.59 U	0.6 U
RA_SO_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	mg/kg	0.58 U	0.62 U	0.61 U	0.53 U	0.63 U	0.59 U	0.6 U
RA_SO_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	2-Chlorophenol	95-57-8	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.0180 J	0.00540 J	0.01 U	0.00500 J	0.00440 J	0.0710	0.0120 J
RA_SO_SVOCs_EPHs	2-Methylphenol	95-48-7	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	2-Nitroaniline	88-74-4	mg/kg	0.58 U	0.62 U	0.61 U	0.53 U	0.63 U	0.59 U	0.6 U
RA_SO_SVOCs_EPHs	2-Nitrophenol	88-75-5	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	3-Nitroaniline	99-09-2	mg/kg	0.58 U	0.62 U	0.61 U	0.53 U	0.63 U	0.59 U	0.6 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-319	SB-320	SB-320	SB-321	SB-321	SB-322	SB-322
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-319-CI19-1-3	SB-320-CI19-0-1	SB-320-CI19-1-3	SB-321-CI19-0-1	SB-321-CI19-1-3	SB-322-CI19-0-1	SB-322-CI19-1-3
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	0.58 U	0.62 U	0.61 U	0.53 U	0.63 U	0.59 U	0.6 U
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg	0.58 U	0.62 U	0.61 U	0.53 U	0.63 U	0.59 U	0.6 U
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg	0.58 U	0.62 U	0.61 U	0.53 U	0.63 U	0.59 U	0.6 U
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg	0.00900 J	0.00830 J	0.01 U	0.0087 U	0.0110 J	0.00500 J	0.0097 U
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg	0.0095 U	0.01 U	0.01 U	0.0087 U	0.01 U	0.0095 U	0.0097 U
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg	0.0130 J	0.0170 J	0.01 U	0.00860 J	0.0250	0.00380 J	0.0097 U
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.1	0.0620	0.01 U	0.0590	0.0890	0.0120 J	0.0140 J
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.1	0.0540	0.01 U	0.0760	0.0920	0.0120 J	0.0170 J
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.17	0.0790	0.00260 J	0.11	0.12	0.0280	0.0310
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.0700	0.0300	0.01 U	0.0760	0.0500	0.0160 J	0.0120 J
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.0580	0.0300	0.01 U	0.0340	0.0600	0.00750 J	0.0110 J
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg	0.58 UJ	0.62 UJ	0.61 UJ	0.53 UJ	0.63 UJ	0.59 UJ	0.6 UJ
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg	0.47 U	0.5 U	0.49 U	0.43 U	0.51 U	0.47 U	0.48 U
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.43	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg							
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg							
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg							
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg							
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg	0.11	0.0620	0.00190 J	0.0740	0.0930	0.0360	0.0260
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.0210	0.0110 J	0.01 U	0.0160 J	0.0160 J	0.00400 J	0.00370 J
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg	0.2	0.12	0.00220 J	0.0790	0.2	0.0210	0.0240
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg	0.00810 J	0.00930 J	0.01 U	0.0087 U	0.00970 J	0.00340 J	0.0097 U
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0890	0.0390	0.01 U	0.0670	0.0640	0.0180 J	0.0160 J
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg	0.0150 J	0.01 U	0.01 U	0.0087 U	0.01 U	0.0330	0.0097 U
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg	0.58 U	0.62 U	0.61 U	0.53 U	0.63 U	0.59 U	0.6 U
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg	0.12	0.0970	0.01 U	0.0350	0.13	0.0370	0.0180 J
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg	0.23 U	0.25 U	0.25 U	0.22 U	0.26 U	0.24 U	0.24 U
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg	0.2	0.12	0.00240 J	0.0930	0.17	0.0220	0.0220
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	1.1	0.61	0.023	0.68	0.95	0.18	0.18
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.19	0.16	0.080 U	0.082	0.20	0.18	0.040
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg	1.3	0.77	0.041	0.77	1.2	0.36	0.22
RA_SO_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-319	SB-320	SB-320	SB-321	SB-321	SB-322	SB-322
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-319-CI19-1-3	SB-320-CI19-0-1	SB-320-CI19-1-3	SB-321-CI19-0-1	SB-321-CI19-1-3	SB-322-CI19-0-1	SB-322-CI19-1-3
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	1,4-Dioxane	123-91-1	mg/kg							
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg	0.012 U	0.012 UJ	0.012 U	0.011 U	0.011 U	0.011 U	0.012 U
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg	0.012 U	0.012 UJ	0.012 U	0.011 U	0.011 U	0.011 U	0.012 U
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg	0.0025 U	0.00720 J	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.012 U	0.012 UJ	0.012 U	0.011 U	0.011 U	0.011 U	0.012 U
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg	0.012 U	0.0420 J	0.012 U	0.0140 J	0.011 U	0.0520	0.012 U
RA_SO_VOCs_VPHs	Acrylonitrile	107-13-1	mg/kg							
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg	0.005 U	0.0048 UJ	0.0046 U	0.0045 U	0.0044 U	0.0046 U	0.005 U
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg							
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg							
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg							
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg	0.005 U	0.0048 UJ	0.0046 U	0.0045 U	0.0044 U	0.0046 U	0.005 U
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg	0.005 U	0.0048 UJ	0.0046 U	0.0045 U	0.0044 U	0.0046 U	0.005 U
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg	0.005 U	0.0048 UJ	0.0046 U	0.0045 U	0.0044 U	0.0046 U	0.005 U
RA_SO_VOCs_VPHs	Diethylether	60-29-7	mg/kg							
RA_SO_VOCs_VPHs	Diisopropyl Ether	108-20-3	mg/kg							
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Freon 113	76-13-1	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-319	SB-320	SB-320	SB-321	SB-321	SB-322	SB-322
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-319-CI19-1-3	SB-320-CI19-0-1	SB-320-CI19-1-3	SB-321-CI19-0-1	SB-321-CI19-1-3	SB-322-CI19-0-1	SB-322-CI19-1-3
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	0.005 U	0.0048 UJ	0.0046 U	0.0045 U	0.0044 U	0.0046 U	0.005 U
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg	0.012 U	0.012 UJ	0.012 U	0.011 U	0.011 U	0.011 U	0.012 U
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg							
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg							
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg							
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg							
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg	0.00140 J	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg	0.012 U	0.012 UJ	0.012 U	0.011 U	0.011 U	0.011 U	0.012 U
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.0025 U	0.0024 UJ	0.00310 J	0.00190 J	0.0022 U	0.00170 J	0.0025 U
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg	0.0074 U	0.0071 UJ	0.007 U	0.0068 U	0.0065 U	0.0068 U	0.0075 U
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.0075 U	0.0072 U	0.0069 U	0.0067 U	0.0066 U	0.0069 U	0.0075 U
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg							
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg	0.0025 U	0.0024 UJ	0.0023 U	0.0022 U	0.0022 U	0.0023 U	0.0025 U
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg	0.005 U	0.0048 UJ	0.0046 U	0.0045 U	0.0044 U	0.0046 U	0.005 U
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg	0.005 U	0.0048 UJ	0.0046 U	0.0045 U	0.0044 U	0.0046 U	0.005 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-323	SB-323	SB-324	SB-324	SB-325	SB-325	SB-326
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-323-CI19-0-1	SB-323-CI19-1-3	SB-324-CI19-0-1	SB-324-CI19-1-3	SB-325-CI19-0-1	SB-325-CI19-1-3	SB-326-CI19-0-1
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO Metals	Aluminum	7429-90-5	mg/kg		9200	6060	11600	5050	5480	2100	6820
RA SO Metals	Antimony	7440-36-0	mg/kg		0.0280 J	0.0480 J	0.0460 J	0.0870	0.185	0.0300 J	0.0400 J
RA SO Metals	Arsenic	7440-38-2	mg/kg		1.94	1.49	2.21	1.65	1.75	0.610	1.48
RA SO Metals	Barium	7440-39-3	mg/kg		26.2	18.1	18.6	16.1	15.0	3.82	8.79
RA SO Metals	Beryllium	7440-41-7	mg/kg		0.518	0.473	0.519	0.380	0.395	0.259	0.447
RA SO Metals	Cadmium	7440-43-9	mg/kg		0.0830 J	0.255	0.0849	1.37	0.496	0.0644 J	0.016 U
RA SO Metals	Calcium	7440-70-2	mg/kg		955	614	495	447	473	230	255
RA SO Metals	Chromium	7440-47-3	mg/kg		6.10	5.02	8.01	6.09	15.4	1.48	5.42
RA SO Metals	Cobalt	7440-48-4	mg/kg		2.71	2.05	1.91	1.86	2.36	2.12	2.64
RA SO Metals	Copper	7440-50-8	mg/kg		4.35	6.00	2.99	8.54	24.3	1.94	8.58
RA SO Metals	Iron	7439-89-6	mg/kg		10100	7220	9560	6400	10500	3960	10000
RA SO Metals	Lead	7439-92-1	mg/kg		7.17	17.9	11.8	44.5	51.0	1.93	7.33
RA SO Metals	Magnesium	7439-95-4	mg/kg		1810	1270	1010	779	1080	286	1230
RA SO Metals	Manganese	7439-96-5	mg/kg		248	153	94.9	75.5	96.1	55.7	75.4
RA SO Metals	Mercury	7439-97-6	mg/kg		0.0260 J	0.0330 J	0.0290 J	0.0430	0.0260 J	0.016 U	0.0160 J
RA SO Metals	Nickel	7440-02-0	mg/kg		3.76	3.38	4.69	4.21	15.8	1.76	5.34
RA SO Metals	Potassium	7440-09-7	mg/kg		1160	708	608	362	479	238	308
RA SO Metals	Selenium	7782-49-2	mg/kg		0.180 J	0.0890 J	0.370 J	0.110 J	0.140 J	0.23 U	0.260 J
RA SO Metals	Silver	7440-22-4	mg/kg		0.0210 J	0.0526 J	0.0290 J	0.108	0.0864	0.00880 J	0.031 U
RA SO Metals	Sodium	7440-23-5	mg/kg		54.1 J	39.4 J	39.0 J	26.2 J	33.4 J	16.0 J	31 U
RA SO Metals	Thallium	7440-28-0	mg/kg		0.133	0.0897	0.110	0.0657	0.0655	0.0300 J	0.0600 J
RA SO Metals	Vanadium	7440-62-2	mg/kg		14.9	8.92	15.1	7.17	8.08	2.70	7.54
RA SO Metals	Zinc	7440-66-6	mg/kg		30.4	29.3	26.5	38.6	46.1	13.2	29.7
RA SO Other	Total Organic Carbon	TOC	mg/kg				20000 J	5000 J			9200 J
RA SO Pest PCBs	Aroclor 1016	12674-11-2	mg/kg								
RA SO Pest PCBs	Aroclor 1221	11104-28-2	mg/kg								
RA SO Pest PCBs	Aroclor 1232	11141-16-5	mg/kg								
RA SO Pest PCBs	Aroclor 1242	53469-21-9	mg/kg								
RA SO Pest PCBs	Aroclor 1248	12672-29-6	mg/kg								
RA SO Pest PCBs	Aroclor 1254	11097-69-1	mg/kg								
RA SO Pest PCBs	Aroclor 1260	11096-82-5	mg/kg								
RA SO Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg								
RA SO Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg								
RA SO SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg		0.01 U	0.0095 U	0.011 U	0.01 UJ	0.01 UJ	0.011 UJ	0.0086 UJ
RA SO SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg		0.64 U	0.58 U	0.65 U	0.62 U	0.64 U	0.7 U	0.53 U
RA SO SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	2,4-Dichlorophenol	120-83-2	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	2,4-Dimethylphenol	105-67-9	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	2,4-Dinitrophenol	51-28-5	mg/kg		0.64 U	0.58 U	0.65 U	0.62 U	0.64 U	0.7 U	0.53 U
RA SO SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	2-Chloronaphthalene	91-58-7	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	2-Chlorophenol	95-57-8	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg		0.01 U	0.0095 U	0.011 U	0.00700 J	0.00940 J	0.011 UJ	0.0086 UJ
RA SO SVOCs EPHs	2-Methylphenol	95-48-7	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	2-Nitroaniline	88-74-4	mg/kg		0.64 U	0.58 U	0.65 U	0.62 U	0.64 U	0.7 U	0.53 U
RA SO SVOCs EPHs	2-Nitrophenol	88-75-5	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg		0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA SO SVOCs EPHs	3-Nitroaniline	99-09-2	mg/kg		0.64 U	0.58 U	0.65 U	0.62 U	0.64 U	0.7 U	0.53 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-323	SB-323	SB-324	SB-324	SB-325	SB-325	SB-326
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-323-CI19-0-1	SB-323-CI19-1-3	SB-324-CI19-0-1	SB-324-CI19-1-3	SB-325-CI19-0-1	SB-325-CI19-1-3	SB-326-CI19-0-1
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	0.64 U	0.58 U	0.65 U	0.62 U	0.64 U	0.7 U	0.53 U
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg	0.64 U	0.58 U	0.65 U	0.62 U	0.64 U	0.7 U	0.53 U
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg	0.64 U	0.58 U	0.65 U	0.62 U	0.64 U	0.7 U	0.53 U
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg	0.01 U	0.0095 U	0.011 U	0.01 UJ	0.01 UJ	0.011 UJ	0.0086 UJ
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg	0.01 U	0.0095 U	0.011 U	0.01 UJ	0.01 UJ	0.011 UJ	0.0086 UJ
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg	0.00340 J	0.00200 J	0.00130 J	0.00440 J	0.0110 J	0.011 UJ	0.00110 J
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.0170 J	0.0240	0.0120 J	0.0330 J	0.0800 J	0.011 UJ	0.0100 J
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.0150 J	0.0150 J	0.0150 J	0.0290 J	0.0830 J	0.011 UJ	0.00920 J
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.0230	0.0400	0.0290	0.0440 J	0.12 J	0.011 UJ	0.0140 J
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.00930 J	0.0120 J	0.0120 J	0.0220 J	0.0590 J	0.011 UJ	0.00850 J
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.00950 J	0.0140 J	0.0110 J	0.0230 J	0.0560 J	0.011 UJ	0.00720 J
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg	0.64 UJ	0.58 UJ	0.65 UJ	0.62 UJ	0.64 UJ	0.7 UJ	0.53 UJ
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg	0.51 U	0.47 U	0.53 U	0.5 U	0.52 U	0.56 U	0.43 U
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg							
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg							
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg							
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg							
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg	0.0170 J	0.0240	0.0220	0.0340 J	0.0720 J	0.011 UJ	0.0110 J
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.00290 J	0.00410 J	0.00320 J	0.00620 J	0.0170 J	0.011 UJ	0.0086 UJ
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg	0.0290	0.0230	0.0310	0.0480 J	0.12 J	0.011 UJ	0.0120 J
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg	0.01 U	0.0095 U	0.011 U	0.01 UJ	0.00430 J	0.011 UJ	0.0086 UJ
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0120 J	0.0160 J	0.0160 J	0.0250 J	0.0720 J	0.011 UJ	0.00800 J
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg	0.01 U	0.0095 U	0.011 U	0.01 UJ	0.00750 J	0.011 UJ	0.0086 UJ
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg	0.64 U	0.58 U	0.65 U	0.62 U	0.64 U	0.7 U	0.53 U
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg	0.0160 J	0.0100 J	0.0140 J	0.0290 J	0.0660 J	0.011 UJ	0.00710 J
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg	0.26 U	0.24 U	0.26 U	0.25 U	0.26 U	0.28 U	0.21 U
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg	0.0270	0.0220	0.0300	0.0420 J	0.11 J	0.011 UJ	0.0140 J
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	0.16	0.19	0.18	0.31	0.79	0.11 U	0.10
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.040	0.024	0.023	0.069	0.12	0.088 U	0.033
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg	0.22	0.23	0.21	0.38	0.91	0.20 U	0.15
RA_SO_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-323	SB-323	SB-324	SB-324	SB-325	SB-325	SB-326
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-323-CI19-0-1	SB-323-CI19-1-3	SB-324-CI19-0-1	SB-324-CI19-1-3	SB-325-CI19-0-1	SB-325-CI19-1-3	SB-326-CI19-0-1
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	1,4-Dioxane	123-91-1	mg/kg							
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg	0.011 U	0.011 U	0.00980 J	0.006 U	0.012 U	0.016 U	0.012 U
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg	0.011 U	0.011 U	0.012 UJ	0.006 U	0.012 U	0.016 U	0.012 U
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.011 U	0.011 U	0.012 UJ	0.006 U	0.012 U	0.016 U	0.012 U
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg	0.0590	0.0230	0.39 J	0.006 U	0.00790 J	0.016 U	0.012 U
RA_SO_VOCs_VPHs	Acrylonitrile	107-13-1	mg/kg							
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg	0.0044 U	0.0043 U	0.005 UJ	0.0024 U	0.0046 U	0.0065 U	0.005 U
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg							
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg							
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg							
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg	0.0022 U	0.0022 U	0.000860 J	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg	0.0044 U	0.0043 U	0.005 UJ	0.0024 U	0.0046 U	0.0065 U	0.005 U
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg	0.0044 U	0.0043 U	0.005 UJ	0.0024 U	0.0046 U	0.0065 U	0.005 U
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0044 U	0.0043 U	0.005 UJ	0.0024 U	0.0046 U	0.0065 U	0.005 U
RA_SO_VOCs_VPHs	Diethylether	60-29-7	mg/kg							
RA_SO_VOCs_VPHs	Diisopropyl Ether	108-20-3	mg/kg							
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Freon 113	76-13-1	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-323	SB-323	SB-324	SB-324	SB-325	SB-325	SB-326
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-323-CI19-0-1	SB-323-CI19-1-3	SB-324-CI19-0-1	SB-324-CI19-1-3	SB-325-CI19-0-1	SB-325-CI19-1-3	SB-326-CI19-0-1
				Sample Date	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019	10/7/2019
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	0.0044 U	0.0043 U	0.005 UJ	0.0024 U	0.0046 U	0.0065 U	0.005 U
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg	0.011 U	0.011 U	0.012 UJ	0.006 U	0.012 U	0.016 U	0.012 U
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg							
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg							
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg							
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg							
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg	0.011 U	0.011 U	0.012 UJ	0.006 U	0.012 U	0.016 U	0.012 U
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.0022 U	0.0022 U	0.00250 J	0.0012 U	0.0023 U	0.00270 J	0.0025 U
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg	0.0066 U	0.0064 U	0.0075 UJ	0.0036 U	0.0069 U	0.0098 U	0.0075 U
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.0066 U	0.0065 U	0.0075 U	0.0036 U	0.0069 U	0.0097 U	0.0075 U
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg							
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg	0.0022 U	0.0022 U	0.0025 UJ	0.0012 U	0.0023 U	0.0032 U	0.0025 U
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg	0.0044 U	0.0043 U	0.005 UJ	0.0024 U	0.0046 U	0.0065 U	0.005 U
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg	0.0044 U	0.0043 U	0.005 UJ	0.0024 U	0.0046 U	0.0065 U	0.005 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-326	SB-BG-1	SB-BG-1	UVF-18
				Sample Type Code	N	N	N	N
				Sample ID	SB-326-CI19-1-3	SB-BG-1-CI19-0-1	SB-BG-1-CI19-1-3	UVF-18_14.25-15.5
				Sample Date	10/7/2019	10/9/2019	10/9/2019	11/22/2010
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	14.25 - 15.5 ft
Method Analyte Group	Compound	CAS #	Units					
RA_SO_Metals	Aluminum	7429-90-5	mg/kg	3780	6210	7570		
RA_SO_Metals	Antimony	7440-36-0	mg/kg	0.0220 J	3.14	3.75		
RA_SO_Metals	Arsenic	7440-38-2	mg/kg	0.940	2.94	7.05		
RA_SO_Metals	Barium	7440-39-3	mg/kg	6.98	27.0	74.3		
RA_SO_Metals	Beryllium	7440-41-7	mg/kg	0.430	0.615	0.516		
RA_SO_Metals	Cadmium	7440-43-9	mg/kg	0.015 U	12.0	9.06		
RA_SO_Metals	Calcium	7440-70-2	mg/kg	241 J	466	451		
RA_SO_Metals	Chromium	7440-47-3	mg/kg	3.18	36.4	77.5		
RA_SO_Metals	Cobalt	7440-48-4	mg/kg	2.39	4.14	5.39		
RA_SO_Metals	Copper	7440-50-8	mg/kg	6.34	85.5	871		
RA_SO_Metals	Iron	7439-89-6	mg/kg	7660 J	13000	19000		
RA_SO_Metals	Lead	7439-92-1	mg/kg	3.64	243	859		
RA_SO_Metals	Magnesium	7439-95-4	mg/kg	961 J	1220	1420		
RA_SO_Metals	Manganese	7439-96-5	mg/kg	79.1 J	147	204		
RA_SO_Metals	Mercury	7439-97-6	mg/kg	0.00820 J	2.14	0.936		
RA_SO_Metals	Nickel	7440-02-0	mg/kg	3.87	17.6	27.8		
RA_SO_Metals	Potassium	7440-09-7	mg/kg	472	532	476		
RA_SO_Metals	Selenium	7782-49-2	mg/kg	0.0730 J	0.170 J	0.220 J		
RA_SO_Metals	Silver	7440-22-4	mg/kg	0.03 U	1.00	2.29		
RA_SO_Metals	Sodium	7440-23-5	mg/kg	30 U	30 U	28 U		
RA_SO_Metals	Thallium	7440-28-0	mg/kg	0.0510 J	0.0824	0.0838		
RA_SO_Metals	Vanadium	7440-62-2	mg/kg	4.93	11.1	12.7		
RA_SO_Metals	Zinc	7440-66-6	mg/kg	22.9	287	277		
RA_SO_Other	Total Organic Carbon	TOC	mg/kg	8800 J	6900	13000		
RA_SO_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg					
RA_SO_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg					
RA_SO_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg					
RA_SO_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg					
RA_SO_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg					
RA_SO_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg					
RA_SO_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg					
RA_SO_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg					
RA_SO_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg					
RA_SO_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	1-Methylnaphthalene	90-12-0	mg/kg	0.0087 UJ	0.00690 J	0.00220 J		
RA_SO_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg	0.53 U	0.64 U	0.65 U		
RA_SO_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	mg/kg	0.53 U	0.64 U	0.65 U		
RA_SO_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	2-Chlorophenol	95-57-8	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.0087 UJ	0.0110 J	0.00410 J	0.21 U	
RA_SO_SVOCs_EPHs	2-Methylphenol	95-48-7	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	2-Nitroaniline	88-74-4	mg/kg	0.53 U	0.64 U	0.65 U		
RA_SO_SVOCs_EPHs	2-Nitrophenol	88-75-5	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.22 U	0.26 U	0.26 U		
RA_SO_SVOCs_EPHs	3-Nitroaniline	99-09-2	mg/kg	0.53 U	0.64 U	0.65 U		

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-326	SB-BG-1	SB-BG-1	UVF-18
				Sample Type Code	N	N	N	N
				Sample ID	SB-326-CI19-1-3	SB-BG-1-CI19-0-1	SB-BG-1-CI19-1-3	UVF-18_14.25-15.5
				Sample Date	10/7/2019	10/9/2019	10/9/2019	11/22/2010
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	14.25 - 15.5 ft
Method Analyte Group	Compound	CAS #	Units					
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	0.53 U	0.64 U	0.65 U	
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg	0.53 U	0.64 U	0.65 U	
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg	0.53 U	0.64 U	0.65 U	
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg	0.0087 UJ	0.01 U	0.01 U	0.42 U
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg	0.0087 UJ	0.01 U	0.01 U	0.21 U
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg	0.0087 UJ	0.0100 J	0.00680 J	0.42 U
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.0087 UJ	0.0780	0.0330	0.42 U
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.0087 UJ	0.0790	0.0290	0.42 U
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.0087 UJ	0.14	0.0550	0.42 U
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.0087 UJ	0.0810	0.0240	0.42 U
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.0087 UJ	0.0380	0.0180 J	0.42 U
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg	0.53 UJ	0.64 UJ	0.65 UJ	
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg	0.43 U	0.51 U	0.52 U	
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.22 U	0.86	0.36	
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg				191 U
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg				15.7 U
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg				15.7 U
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg				15.7 U
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg	0.0087 UJ	0.0780	0.0300	0.42 U
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.0087 UJ	0.0130 J	0.01 U	0.21 U
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg	0.0087 UJ	0.0980	0.0400	0.42 U
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg	0.0087 UJ	0.01 U	0.01 U	0.42 U
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0087 UJ	0.0750	0.0250	0.42 U
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg	0.0087 UJ	0.01 U	0.00490 J	0.42 U
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg	0.53 U	0.64 U	0.65 U	
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg	0.0087 UJ	0.0650	0.0350	0.42 U
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg	0.22 U	0.26 U	0.26 U	
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg	0.0087 UJ	0.12	0.0470	0.42 U
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	0.087 U	0.80	0.31	4.0 U
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.070 U	0.12	0.066	2.5 U
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg	0.16 U	0.92	0.37	6.5 U
RA_SO_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0028 U			
RA_SO_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0028 U			

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-326	SB-BG-1	SB-BG-1	UVF-18
				Sample Type Code	N	N	N	N
				Sample ID	SB-326-CI19-1-3	SB-BG-1-CI19-0-1	SB-BG-1-CI19-1-3	UVF-18_14.25-15.5
				Sample Date	10/7/2019	10/9/2019	10/9/2019	11/22/2010
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	14.25 - 15.5 ft
Method Analyte Group	Compound	CAS #	Units					
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	1,4-Dioxane	123-91-1	mg/kg					
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg	0.0120 J				
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg	0.014 U				
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.014 U				
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg	0.25				
RA_SO_VOCs_VPHs	Acrylonitrile	107-13-1	mg/kg					
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg	0.0028 U				0.22 U
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg	0.0055 U				
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg					191 U
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg					11 U
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg					191 U
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg	0.0055 U				
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg	0.0055 U				
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0055 U				
RA_SO_VOCs_VPHs	Diethylether	60-29-7	mg/kg					
RA_SO_VOCs_VPHs	Diisopropyl Ether	108-20-3	mg/kg					
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg	0.0028 U				0.22 U
RA_SO_VOCs_VPHs	Freon 113	76-13-1	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg	0.0028 U				

ATTACHMENT A, TABLE A-1B
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	SB-326	SB-BG-1	SB-BG-1	UVF-18
				Sample Type Code	N	N	N	N
				Sample ID	SB-326-CI19-1-3	SB-BG-1-CI19-0-1	SB-BG-1-CI19-1-3	UVF-18_14.25-15.5
				Sample Date	10/7/2019	10/9/2019	10/9/2019	11/22/2010
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	14.25 - 15.5 ft
Method Analyte Group	Compound	CAS #	Units					
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	0.0055 U				0.44 U
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg	0.014 U				
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0028 U				0.05 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg					0.22 U
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	0.0028 U				0.22 U
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	tert-Amylmethyl Ether	994-05-8	mg/kg					
RA_SO_VOCs_VPHs	tert-Butyl Alcohol	75-65-0	mg/kg					
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	tert-Butylethyl Ether	637-92-3	mg/kg					
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Tetrahydrofuran	109-99-9	mg/kg	0.014 U				
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.00230 J				0.22 U
RA_SO_VOCs_VPHs	Xylenes, total (a)	1330-20-7	mg/kg	0.0082 U				
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.0083 U				0.66 U
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	trans-1,4-Dichloro-2-Butene	764-41-0	mg/kg					
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg	0.0028 U				
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg	0.0055 U				
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg	0.0055 U				

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	B-12-110502 (S-2)	CDW-1	CDW-2	CDW-3	CDW-5	SB-106	SB-106
			Sample Type Code	N	N	N	N	N	N	N
			Sample ID	B-12-110502 (S-2)	MW-11-110502 (S-3)	MW-08-110502 (S-3)	MW-07-110502 (S-6)	MW-01-110502 (S-4)	SB-106A 0-5	SB-106A 3-5
			Sample Date	11/5/2002	11/5/2002	11/8/2002	11/5/2002	11/5/2002	11/21/2011	11/21/2011
			Depth Interval	2 - 4 ft	4 - 6 ft	6 - 8 ft	10 - 12 ft	6 - 8 ft	0 - 5 ft	3 - 5 ft
Method Analyte Group	Compound	CAS #	Units							
RA SO Metals	Aluminum	7429-90-5	mg/kg							
RA SO Metals	Antimony	7440-36-0	mg/kg							
RA SO Metals	Arsenic	7440-38-2	mg/kg							
RA SO Metals	Barium	7440-39-3	mg/kg							
RA SO Metals	Beryllium	7440-41-7	mg/kg							
RA SO Metals	Cadmium	7440-43-9	mg/kg							
RA SO Metals	Calcium	7440-70-2	mg/kg							
RA SO Metals	Chromium	7440-47-3	mg/kg							
RA SO Metals	Cobalt	7440-48-4	mg/kg							
RA SO Metals	Copper	7440-50-8	mg/kg							
RA SO Metals	Iron	7439-89-6	mg/kg							
RA SO Metals	Lead	7439-92-1	mg/kg							
RA SO Metals	Magnesium	7439-95-4	mg/kg							
RA SO Metals	Manganese	7439-96-5	mg/kg							
RA SO Metals	Mercury	7439-97-6	mg/kg							
RA SO Metals	Nickel	7440-02-0	mg/kg							
RA SO Metals	Potassium	7440-09-7	mg/kg							
RA SO Metals	Selenium	7782-49-2	mg/kg							
RA SO Metals	Silver	7440-22-4	mg/kg							
RA SO Metals	Sodium	7440-23-5	mg/kg							
RA SO Metals	Thallium	7440-28-0	mg/kg							
RA SO Metals	Vanadium	7440-62-2	mg/kg							
RA SO Metals	Zinc	7440-66-6	mg/kg							
RA SO Other	Total Organic Carbon	TOC	mg/kg						2100	
RA SO Pest PCBs	Aroclor 1016	12674-11-2	mg/kg							
RA SO Pest PCBs	Aroclor 1221	11104-28-2	mg/kg							
RA SO Pest PCBs	Aroclor 1232	11141-16-5	mg/kg							
RA SO Pest PCBs	Aroclor 1242	53469-21-9	mg/kg							
RA SO Pest PCBs	Aroclor 1248	12672-29-6	mg/kg							
RA SO Pest PCBs	Aroclor 1254	11097-69-1	mg/kg							
RA SO Pest PCBs	Aroclor 1260	11096-82-5	mg/kg							
RA SO Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg							
RA SO Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg							
RA SO SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg							
RA SO SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg							
RA SO SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg							
RA SO SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg							
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg							
RA SO SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg							
RA SO SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg							
RA SO SVOCs EPHs	2,4-Dichlorophenol	120-83-2	mg/kg							
RA SO SVOCs EPHs	2,4-Dimethylphenol	105-67-9	mg/kg							
RA SO SVOCs EPHs	2,4-Dinitrophenol	51-28-5	mg/kg							
RA SO SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg							
RA SO SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg							
RA SO SVOCs EPHs	2-Chloronaphthalene	91-58-7	mg/kg							
RA SO SVOCs EPHs	2-Chlorophenol	95-57-8	mg/kg							
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg							
RA SO SVOCs EPHs	2-Methylphenol	95-48-7	mg/kg							
RA SO SVOCs EPHs	2-Nitroaniline	88-74-4	mg/kg							
RA SO SVOCs EPHs	2-Nitrophenol	88-75-5	mg/kg							
RA SO SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg							
RA SO SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg							

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	B-12-110502 (S-2)	CDW-1	CDW-2	CDW-3	CDW-5	SB-106	SB-106
			Sample Type Code	N	N	N	N	N	N	N
			Sample ID	B-12-110502 (S-2)	MW-11-110502 (S-3)	MW-08-110502 (S-3)	MW-07-110502 (S-6)	MW-01-110502 (S-4)	SB-106A 0-5	SB-106A 3-5
			Sample Date	11/5/2002	11/5/2002	11/8/2002	11/5/2002	11/5/2002	11/21/2011	11/21/2011
			Depth Interval	2 - 4 ft	4 - 6 ft	6 - 8 ft	10 - 12 ft	6 - 8 ft	0 - 5 ft	3 - 5 ft
Method Analyte Group	Compound	CAS #	Units							
RA SO SVOCs EPHs	3-Nitroaniline	99-09-2	mg/kg							
RA SO SVOCs EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg							
RA SO SVOCs EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg							
RA SO SVOCs EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg							
RA SO SVOCs EPHs	4-Chloroaniline	106-47-8	mg/kg							
RA SO SVOCs EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg							
RA SO SVOCs EPHs	4-Nitroaniline	100-01-6	mg/kg							
RA SO SVOCs EPHs	4-Nitrophenol	100-02-7	mg/kg							
RA SO SVOCs EPHs	Acenaphthene	83-32-9	mg/kg							
RA SO SVOCs EPHs	Acenaphthylene	208-96-8	mg/kg							
RA SO SVOCs EPHs	Anthracene	120-12-7	mg/kg							
RA SO SVOCs EPHs	Benzo(a)anthracene	56-55-3	mg/kg							
RA SO SVOCs EPHs	Benzo(a)Pyrene	50-32-8	mg/kg							
RA SO SVOCs EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg							
RA SO SVOCs EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg							
RA SO SVOCs EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg							
RA SO SVOCs EPHs	Benzoic acid	65-85-0	mg/kg							
RA SO SVOCs EPHs	Benzyl Alcohol	100-51-6	mg/kg							
RA SO SVOCs EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg							
RA SO SVOCs EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg							
RA SO SVOCs EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg							
RA SO SVOCs EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg							
RA SO SVOCs EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg							
RA SO SVOCs EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg							
RA SO SVOCs EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg							
RA SO SVOCs EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg							
RA SO SVOCs EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg							
RA SO SVOCs EPHs	Carbazole	86-74-8	mg/kg							
RA SO SVOCs EPHs	Chrysene	218-01-9	mg/kg							
RA SO SVOCs EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg							
RA SO SVOCs EPHs	Dibenzofuran	132-64-9	mg/kg							
RA SO SVOCs EPHs	Diethyl Phthalate	84-66-2	mg/kg							
RA SO SVOCs EPHs	Dimethyl Phthalate	131-11-3	mg/kg							
RA SO SVOCs EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg							
RA SO SVOCs EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg							
RA SO SVOCs EPHs	Fluoranthene	206-44-0	mg/kg							
RA SO SVOCs EPHs	Fluorene	86-73-7	mg/kg							
RA SO SVOCs EPHs	Hexachlorobenzene	118-74-1	mg/kg							
RA SO SVOCs EPHs	Hexachloroethane	67-72-1	mg/kg							
RA SO SVOCs EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg							
RA SO SVOCs EPHs	Isophorone	78-59-1	mg/kg							
RA SO SVOCs EPHs	Naphthalene	91-20-3	mg/kg							
RA SO SVOCs EPHs	Nitrobenzene	98-95-3	mg/kg							
RA SO SVOCs EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg							
RA SO SVOCs EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg							
RA SO SVOCs EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg							
RA SO SVOCs EPHs	Pentachlorophenol	87-86-5	mg/kg							
RA SO SVOCs EPHs	Phenanthrene	85-01-8	mg/kg							
RA SO SVOCs EPHs	Phenol	108-95-2	mg/kg							
RA SO SVOCs EPHs	Pyrene	129-00-0	mg/kg							
RA SO SVOCs EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg							
RA SO SVOCs EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg							
RA SO SVOCs EPHs	Total PAHs (b)	Tot-PAH	mg/kg							

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	B-12-110502 (S-2)	CDW-1	CDW-2	CDW-3	CDW-5	SB-106	SB-106
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	B-12-110502 (S-2)	MW-11-110502 (S-3)	MW-08-110502 (S-3)	MW-07-110502 (S-6)	MW-01-110502 (S-4)	SB-106A 0-5	SB-106A 3-5
				Sample Date	11/5/2002	11/5/2002	11/8/2002	11/5/2002	11/5/2002	11/21/2011	11/21/2011
				Depth Interval	2 - 4 ft	4 - 6 ft	6 - 8 ft	10 - 12 ft	6 - 8 ft	0 - 5 ft	3 - 5 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO VOCs VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg								0.0033 U
RA SO VOCs VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg								0.0033 U
RA SO VOCs VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg								0.0033 U
RA SO VOCs VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg								0.0033 U
RA SO VOCs VPHs	1,1-Dichloroethane	75-34-3	mg/kg								0.0033 U
RA SO VOCs VPHs	1,1-Dichloroethene	75-35-4	mg/kg								0.0033 U
RA SO VOCs VPHs	1,1-Dichloropropene	563-58-6	mg/kg								0.0033 U
RA SO VOCs VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg								0.0033 U
RA SO VOCs VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg								0.0033 U
RA SO VOCs VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								0.0033 U
RA SO VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg								0.0033 U
RA SO VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg								0.0033 U
RA SO VOCs VPHs	1,2-Dibromoethane	106-93-4	mg/kg								0.0033 U
RA SO VOCs VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								0.0033 U
RA SO VOCs VPHs	1,2-Dichloroethane	107-06-2	mg/kg								0.0033 U
RA SO VOCs VPHs	1,2-Dichloropropane	78-87-5	mg/kg								0.0033 U
RA SO VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg								0.0033 U
RA SO VOCs VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								0.0033 U
RA SO VOCs VPHs	1,3-Dichloropropane	142-28-9	mg/kg								0.0033 U
RA SO VOCs VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								0.0033 U
RA SO VOCs VPHs	2,2-Dichloropropane	594-20-7	mg/kg								0.0033 U
RA SO VOCs VPHs	2-Butanone (MEK)	78-93-3	mg/kg								0.0328 U
RA SO VOCs VPHs	2-Chlorotoluene	95-49-8	mg/kg								0.0033 U
RA SO VOCs VPHs	2-Hexanone	591-78-6	mg/kg								0.0328 U
RA SO VOCs VPHs	4-Chlorotoluene	106-43-4	mg/kg								0.0033 U
RA SO VOCs VPHs	4-Isopropyltoluene	99-87-6	mg/kg								0.0033 U
RA SO VOCs VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg								0.0328 U
RA SO VOCs VPHs	Acetone	67-64-1	mg/kg								0.0328 U
RA SO VOCs VPHs	Benzene	71-43-2	mg/kg								0.0033 U
RA SO VOCs VPHs	Bromobenzene	108-86-1	mg/kg								0.0033 U
RA SO VOCs VPHs	Bromochloromethane	74-97-5	mg/kg								0.0033 U
RA SO VOCs VPHs	Bromodichloromethane	75-27-4	mg/kg								0.0033 U
RA SO VOCs VPHs	Bromoform	75-25-2	mg/kg								0.0033 U
RA SO VOCs VPHs	Bromomethane	74-83-9	mg/kg								0.0066 U
RA SO VOCs VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg								
RA SO VOCs VPHs	C5-C8 ALIPHATICS (UNADJUSTED)	C5-C8_ALI_UN	mg/kg								
RA SO VOCs VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg								
RA SO VOCs VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg								
RA SO VOCs VPHs	C9-C12 ALIPHATICS (UNADJUSTED)	C9-C12ALIPH	mg/kg								
RA SO VOCs VPHs	Carbon Disulfide	75-15-0	mg/kg								0.0033 U
RA SO VOCs VPHs	Carbon Tetrachloride	56-23-5	mg/kg								0.0033 U
RA SO VOCs VPHs	Chlorobenzene	108-90-7	mg/kg								0.0033 U
RA SO VOCs VPHs	Chloroethane	75-00-3	mg/kg								0.0066 U
RA SO VOCs VPHs	Chloroform	67-66-3	mg/kg								0.0033 U
RA SO VOCs VPHs	Chloromethane	74-87-3	mg/kg								0.0066 U
RA SO VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg								0.01
RA SO VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg								0.0033 U
RA SO VOCs VPHs	dibromochloromethane	124-48-1	mg/kg								0.0033 U
RA SO VOCs VPHs	Dibromomethane	74-95-3	mg/kg								0.0033 U
RA SO VOCs VPHs	Dichlorodifluoromethane	75-71-8	mg/kg								0.0066 U
RA SO VOCs VPHs	Ethylbenzene	100-41-4	mg/kg								0.0033 U
RA SO VOCs VPHs	Hexachlorobutadiene	87-68-3	mg/kg								0.0033 U
RA SO VOCs VPHs	Isopropylbenzene	98-82-8	mg/kg								0.0033 U

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	B-12-110502 (S-2)	CDW-1	CDW-2	CDW-3	CDW-5	SB-106	SB-106
			Sample Type Code	N	N	N	N	N	N	N
			Sample ID	B-12-110502 (S-2)	MW-11-110502 (S-3)	MW-08-110502 (S-3)	MW-07-110502 (S-6)	MW-01-110502 (S-4)	SB-106A 0-5	SB-106A 3-5
			Sample Date	11/5/2002	11/5/2002	11/8/2002	11/5/2002	11/5/2002	11/21/2011	11/21/2011
			Depth Interval	2 - 4 ft	4 - 6 ft	6 - 8 ft	10 - 12 ft	6 - 8 ft	0 - 5 ft	3 - 5 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg							0.0066 U
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg							0.0164 U
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg							0.0033 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg							3.3 U
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg							0.0033 U
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg							0.0033 U
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg							0.0033 U
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg							0.0033 U
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg							0.0033 U
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg							0.0033 U
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg							0.0033 U
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg							0.0033 U
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg							0.0099 U
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg							0.0033 U
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg							0.0033 U
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg							0.0284
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg							0.0033 U
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg							0.0066 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SB-201	SB-202	SB-202	SB-203	SB-204	SB-205	SB-206
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-201-A 8-10	SB-202-A 13-15	SB-202-A 8-10	SB-203-A 8-10	SB-204-A 8-10	SB-205-A 7-9	SB-206-A 8-10
				Sample Date	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013
				Depth Interval	8 - 10 ft	13 - 15 ft	8 - 10 ft	8 - 10 ft	8 - 10 ft	7 - 9 ft	8 - 10 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO Metals	Aluminum	7429-90-5	mg/kg								
RA SO Metals	Antimony	7440-36-0	mg/kg								
RA SO Metals	Arsenic	7440-38-2	mg/kg								
RA SO Metals	Barium	7440-39-3	mg/kg								
RA SO Metals	Beryllium	7440-41-7	mg/kg								
RA SO Metals	Cadmium	7440-43-9	mg/kg								
RA SO Metals	Calcium	7440-70-2	mg/kg								
RA SO Metals	Chromium	7440-47-3	mg/kg								
RA SO Metals	Cobalt	7440-48-4	mg/kg								
RA SO Metals	Copper	7440-50-8	mg/kg								
RA SO Metals	Iron	7439-89-6	mg/kg								
RA SO Metals	Lead	7439-92-1	mg/kg								
RA SO Metals	Magnesium	7439-95-4	mg/kg								
RA SO Metals	Manganese	7439-96-5	mg/kg								
RA SO Metals	Mercury	7439-97-6	mg/kg								
RA SO Metals	Nickel	7440-02-0	mg/kg								
RA SO Metals	Potassium	7440-09-7	mg/kg								
RA SO Metals	Selenium	7782-49-2	mg/kg								
RA SO Metals	Silver	7440-22-4	mg/kg								
RA SO Metals	Sodium	7440-23-5	mg/kg								
RA SO Metals	Thallium	7440-28-0	mg/kg								
RA SO Metals	Vanadium	7440-62-2	mg/kg								
RA SO Metals	Zinc	7440-66-6	mg/kg								
RA SO Other	Total Organic Carbon	TOC	mg/kg								
RA SO Pest PCBs	Aroclor 1016	12674-11-2	mg/kg								
RA SO Pest PCBs	Aroclor 1221	11104-28-2	mg/kg								
RA SO Pest PCBs	Aroclor 1232	11141-16-5	mg/kg								
RA SO Pest PCBs	Aroclor 1242	53469-21-9	mg/kg								
RA SO Pest PCBs	Aroclor 1248	12672-29-6	mg/kg								
RA SO Pest PCBs	Aroclor 1254	11097-69-1	mg/kg								
RA SO Pest PCBs	Aroclor 1260	11096-82-5	mg/kg								
RA SO Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg								
RA SO Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg								
RA SO SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA SO SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA SO SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA SO SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg								
RA SO SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg								
RA SO SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg								
RA SO SVOCs EPHs	2,4-Dichlorophenol	120-83-2	mg/kg								
RA SO SVOCs EPHs	2,4-Dimethylphenol	105-67-9	mg/kg								
RA SO SVOCs EPHs	2,4-Dinitrophenol	51-28-5	mg/kg								
RA SO SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg								
RA SO SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg								
RA SO SVOCs EPHs	2-Chloronaphthalene	91-58-7	mg/kg								
RA SO SVOCs EPHs	2-Chlorophenol	95-57-8	mg/kg								
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg		0.23	1.46	3.96	2.01	2.74	0.56	
RA SO SVOCs EPHs	2-Methylphenol	95-48-7	mg/kg								
RA SO SVOCs EPHs	2-Nitroaniline	88-74-4	mg/kg								
RA SO SVOCs EPHs	2-Nitrophenol	88-75-5	mg/kg								
RA SO SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg								
RA SO SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg								

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SB-201	SB-202	SB-202	SB-203	SB-204	SB-205	SB-206
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-201-A 8-10	SB-202-A 13-15	SB-202-A 8-10	SB-203-A 8-10	SB-204-A 8-10	SB-205-A 7-9	SB-206-A 8-10
				Sample Date	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013
				Depth Interval	8 - 10 ft	13 - 15 ft	8 - 10 ft	8 - 10 ft	8 - 10 ft	7 - 9 ft	8 - 10 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	3-Nitroaniline	99-09-2	mg/kg								
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg								
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg								
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg	0.13 J	0.16 U	0.17 U	0.09 J	0.18 U	0.19 U	0.19 U	
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg	0.17 U	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	0.19 U	
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg	0.17 U	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	0.17 J	
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.17 U	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	0.66	
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.17 U	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	0.64	
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.17 U	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	0.81	
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.17 U	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	0.23 J	
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.17 U	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	0.27 J	
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg								
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg								
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg	214	11.5 J	175	166	67.1	50.7	119	
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg	217	11.8 J	176	171	69.8	55.1	126	
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg	28.8 U	5.4 U	29 U	28 U	6.1 J	6.5 U	59.7	
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg	1450 J	51.3 J	2270 J	965 J	318 J	306 J	123 J	
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg								
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg	0.17 U	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	0.65	
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.17 U	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	0.19 U	
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg								
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg								
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg	0.1 J	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	1.16	
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg	0.09 J	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	0.19 U	
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg								
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg								
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.17 U	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	0.28 J	
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg								
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg	0.28 J	0.16 U	0.13 J	0.24 J	0.7	1.65	0.28 J	
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg								
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg								
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg	0.14 J	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	0.53 J	
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg								
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg	0.17 U	0.16 U	0.17 U	0.16 U	0.18 U	0.19 U	1.04	
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	1.6	1.6 U	1.7 U	1.6 U	1.8 U	1.9 U	5.9	
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.88	1.2	2.2	4.7	3.6	5.3	2.1	
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg	2.0	2.8	3.5	5.6	5.4	7.2	8.0	

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SB-201	SB-202	SB-202	SB-203	SB-204	SB-205	SB-206
			Sample Type Code	N	N	N	N	N	N	N
			Sample ID	SB-201-A 8-10	SB-202-A 13-15	SB-202-A 8-10	SB-203-A 8-10	SB-204-A 8-10	SB-205-A 7-9	SB-206-A 8-10
			Sample Date	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013
			Depth Interval	8 - 10 ft	13 - 15 ft	8 - 10 ft	8 - 10 ft	8 - 10 ft	7 - 9 ft	8 - 10 ft
Method Analyte Group	Compound	CAS #	Units							
RA SO VOCs VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg							
RA SO VOCs VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg							
RA SO VOCs VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg							
RA SO VOCs VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg							
RA SO VOCs VPHs	1,1-Dichloroethane	75-34-3	mg/kg							
RA SO VOCs VPHs	1,1-Dichloroethene	75-35-4	mg/kg							
RA SO VOCs VPHs	1,1-Dichloropropene	563-58-6	mg/kg							
RA SO VOCs VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg							
RA SO VOCs VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg							
RA SO VOCs VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg							
RA SO VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg							
RA SO VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg							
RA SO VOCs VPHs	1,2-Dibromoethane	106-93-4	mg/kg							
RA SO VOCs VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg							
RA SO VOCs VPHs	1,2-Dichloroethane	107-06-2	mg/kg							
RA SO VOCs VPHs	1,2-Dichloropropane	78-87-5	mg/kg							
RA SO VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg							
RA SO VOCs VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg							
RA SO VOCs VPHs	1,3-Dichloropropane	142-28-9	mg/kg							
RA SO VOCs VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg							
RA SO VOCs VPHs	2,2-Dichloropropane	594-20-7	mg/kg							
RA SO VOCs VPHs	2-Butanone (MEK)	78-93-3	mg/kg							
RA SO VOCs VPHs	2-Chlorotoluene	95-49-8	mg/kg							
RA SO VOCs VPHs	2-Hexanone	591-78-6	mg/kg							
RA SO VOCs VPHs	4-Chlorotoluene	106-43-4	mg/kg							
RA SO VOCs VPHs	4-Isopropyltoluene	99-87-6	mg/kg							
RA SO VOCs VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg							
RA SO VOCs VPHs	Acetone	67-64-1	mg/kg							
RA SO VOCs VPHs	Benzene	71-43-2	mg/kg	0.05 U	0.05 U	0.04 U	0.04 U	0.04 U	0.05 U	0.41 J
RA SO VOCs VPHs	Bromobenzene	108-86-1	mg/kg							
RA SO VOCs VPHs	Bromochloromethane	74-97-5	mg/kg							
RA SO VOCs VPHs	Bromodichloromethane	75-27-4	mg/kg							
RA SO VOCs VPHs	Bromoform	75-25-2	mg/kg							
RA SO VOCs VPHs	Bromomethane	74-83-9	mg/kg							
RA SO VOCs VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg	153 J	6.78 U	14 J	31.2 J	41 J	15.2 J	98.1 J
RA SO VOCs VPHs	C5-C8 ALIPHATICS (UNADJUSTED)	C5-C8_ALI_UN	mg/kg	153 J	6.78 U	14 J	31.2 J	41 J	15.2 J	98.5 J
RA SO VOCs VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg	128 J	32.2 J	94.4 J	154 J	96.9 J	60 J	46.3 J
RA SO VOCs VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg	259 J	82.2 J	217 J	316 J	195 J	119 J	86 J
RA SO VOCs VPHs	C9-C12 ALIPHATICS (UNADJUSTED)	C9-C12ALIPH	mg/kg	393 J	115 J	314 J	474 J	294 J	181 J	147 J
RA SO VOCs VPHs	Carbon Disulfide	75-15-0	mg/kg							
RA SO VOCs VPHs	Carbon Tetrachloride	56-23-5	mg/kg							
RA SO VOCs VPHs	Chlorobenzene	108-90-7	mg/kg							
RA SO VOCs VPHs	Chloroethane	75-00-3	mg/kg							
RA SO VOCs VPHs	Chloroform	67-66-3	mg/kg							
RA SO VOCs VPHs	Chloromethane	74-87-3	mg/kg							
RA SO VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg							
RA SO VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg							
RA SO VOCs VPHs	dibromochloromethane	124-48-1	mg/kg							
RA SO VOCs VPHs	Dibromomethane	74-95-3	mg/kg							
RA SO VOCs VPHs	Dichlorodifluoromethane	75-71-8	mg/kg							
RA SO VOCs VPHs	Ethylbenzene	100-41-4	mg/kg	4.09 J	0.32 J	1.04 J	3.93 J	1.07 J	1.5 J	1.77 J
RA SO VOCs VPHs	Hexachlorobutadiene	87-68-3	mg/kg							
RA SO VOCs VPHs	Isopropylbenzene	98-82-8	mg/kg							

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SB-201	SB-202	SB-202	SB-203	SB-204	SB-205	SB-206
			Sample Type Code	N	N	N	N	N	N	N
			Sample ID	SB-201-A 8-10	SB-202-A 13-15	SB-202-A 8-10	SB-203-A 8-10	SB-204-A 8-10	SB-205-A 7-9	SB-206-A 8-10
			Sample Date	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013
			Depth Interval	8 - 10 ft	13 - 15 ft	8 - 10 ft	8 - 10 ft	8 - 10 ft	7 - 9 ft	8 - 10 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	0.16 J	0.15 J	0.12 J	0.08 J	0.99 J	0.51 J	12.7 J
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg							
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.05 U	0.05 U	0.04 U	0.04 U	0.04 U	0.05 U	0.08 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg	3.52 J	0.79 J	2.53 J	3.19 J	6.2 J	6.86 J	1.19 J
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg							
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg							
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	0.93 J	0.23 J	1.25 J	0.57 J	0.4 J	0.12 J	0.35 J
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg							
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg							
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg							
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg							
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.44 J	0.05 UJ	0.04 UJ	0.02 J	0.04 UJ	0.02 J	0.08 UJ
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	1.1	0.38	1.4	0.65	1.4	0.63	13
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg							
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg							
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg							
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg							
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg							

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SB-207	SB-208	SB-209	SB-209	SB-210	SB-213	SB-214
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-207-A 8-10	SB-208-A 8-10	SB-209-A 10-12	SB-209-A 8-10	SB-210-A 8-10	SB-213-A 6-8	SB-214-A 6-8
				Sample Date	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013
				Depth Interval	8 - 10 ft	8 - 10 ft	10 - 12 ft	8 - 10 ft	8 - 10 ft	6 - 8 ft	6 - 8 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO Metals	Aluminum	7429-90-5	mg/kg								
RA SO Metals	Antimony	7440-36-0	mg/kg								
RA SO Metals	Arsenic	7440-38-2	mg/kg								
RA SO Metals	Barium	7440-39-3	mg/kg								
RA SO Metals	Beryllium	7440-41-7	mg/kg								
RA SO Metals	Cadmium	7440-43-9	mg/kg								
RA SO Metals	Calcium	7440-70-2	mg/kg								
RA SO Metals	Chromium	7440-47-3	mg/kg								
RA SO Metals	Cobalt	7440-48-4	mg/kg								
RA SO Metals	Copper	7440-50-8	mg/kg								
RA SO Metals	Iron	7439-89-6	mg/kg								
RA SO Metals	Lead	7439-92-1	mg/kg								
RA SO Metals	Magnesium	7439-95-4	mg/kg								
RA SO Metals	Manganese	7439-96-5	mg/kg								
RA SO Metals	Mercury	7439-97-6	mg/kg								
RA SO Metals	Nickel	7440-02-0	mg/kg								
RA SO Metals	Potassium	7440-09-7	mg/kg								
RA SO Metals	Selenium	7782-49-2	mg/kg								
RA SO Metals	Silver	7440-22-4	mg/kg								
RA SO Metals	Sodium	7440-23-5	mg/kg								
RA SO Metals	Thallium	7440-28-0	mg/kg								
RA SO Metals	Vanadium	7440-62-2	mg/kg								
RA SO Metals	Zinc	7440-66-6	mg/kg								
RA SO Other	Total Organic Carbon	TOC	mg/kg								
RA SO Pest PCBs	Aroclor 1016	12674-11-2	mg/kg								
RA SO Pest PCBs	Aroclor 1221	11104-28-2	mg/kg								
RA SO Pest PCBs	Aroclor 1232	11141-16-5	mg/kg								
RA SO Pest PCBs	Aroclor 1242	53469-21-9	mg/kg								
RA SO Pest PCBs	Aroclor 1248	12672-29-6	mg/kg								
RA SO Pest PCBs	Aroclor 1254	11097-69-1	mg/kg								
RA SO Pest PCBs	Aroclor 1260	11096-82-5	mg/kg								
RA SO Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg								
RA SO Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg								
RA SO SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA SO SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA SO SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA SO SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg								
RA SO SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg								
RA SO SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg								
RA SO SVOCs EPHs	2,4-Dichlorophenol	120-83-2	mg/kg								
RA SO SVOCs EPHs	2,4-Dimethylphenol	105-67-9	mg/kg								
RA SO SVOCs EPHs	2,4-Dinitrophenol	51-28-5	mg/kg								
RA SO SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg								
RA SO SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg								
RA SO SVOCs EPHs	2-Chloronaphthalene	91-58-7	mg/kg								
RA SO SVOCs EPHs	2-Chlorophenol	95-57-8	mg/kg								
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.7 U	0.92	1.56	7.02	8.82	0.16 U	3.11	
RA SO SVOCs EPHs	2-Methylphenol	95-48-7	mg/kg								
RA SO SVOCs EPHs	2-Nitroaniline	88-74-4	mg/kg								
RA SO SVOCs EPHs	2-Nitrophenol	88-75-5	mg/kg								
RA SO SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg								
RA SO SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg								

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SB-207	SB-208	SB-209	SB-209	SB-210	SB-213	SB-214
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-207-A 8-10	SB-208-A 8-10	SB-209-A 10-12	SB-209-A 8-10	SB-210-A 8-10	SB-213-A 6-8	SB-214-A 6-8
				Sample Date	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013
				Depth Interval	8 - 10 ft	8 - 10 ft	10 - 12 ft	8 - 10 ft	8 - 10 ft	6 - 8 ft	6 - 8 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	3-Nitroaniline	99-09-2	mg/kg								
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg								
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg								
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg								
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg								
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg								
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg	0.7 U	0.16 U	0.17 U	0.14 J	0.12 J	0.16 U	0.15 J	
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg	0.7 U	0.16 U	0.17 U	0.17 U	0.17 U	0.16 U	0.17 U	
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg	0.7 U	0.16 U	0.17 U	0.17 U	0.17 U	0.16 U	0.17 U	
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.7 U	0.16 U	0.17 U	0.17 U	0.17 U	0.16 U	0.17 U	
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.86 J	0.16 U	0.17 U	0.17 U	0.17 U	0.16 U	0.17 U	
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.7 U	0.16 U	0.17 U	0.17 U	0.17 U	0.16 U	0.17 U	
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.7 U	0.16 U	0.17 U	0.17 U	0.17 U	0.16 U	0.17 U	
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.7 U	0.16 U	0.17 U	0.17 U	0.17 U	0.16 U	0.17 U	
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg								
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg								
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg								
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg								
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg	46.3 J	56.8	95.6	196	351	249	264	
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg	62 J	58.5	98	206	365	249	268	
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg	41.5 J	72.1	28.3	28.9 U	153	203	29 U	
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg	16.3 J	79.5 J	554 J	898 J	1260 J	193 J	1380 J	
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg								
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg	0.7 U	0.16 U	0.17 U	0.17 U	0.17 U	0.16 U	0.17 U	
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.7 U	0.16 U	0.17 U	0.17 U	0.17 U	0.16 U	0.17 U	
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg								
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg								
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg								
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg								
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg	0.7 U	0.16 U	0.17 U	0.17 U	0.17 U	0.16 U	0.17 U	
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg	0.7 U	0.16 U	0.17 U	0.1 J	0.11 J	0.12 J	0.12 J	
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg								
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg								
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.7 U	0.16 U	0.17 U	0.17 U	0.17 U	0.16 U	0.17 U	
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg								
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg	14.8	0.74	0.76	2.7	4.68	0.16 U	0.61	
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg								
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg								
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg								
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg	0.7 U	0.16 U	0.17 U	0.09 J	0.17 U	0.2 J	0.17 U	
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg								
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg	0.7 U	0.16 U	0.1 J	0.17 U	0.17 U	0.09 J	0.17 U	
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	7.2	1.6 U	1.6	1.7 U	1.7 U	1.5	1.7 U	
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	19	2.5	3.2	10	14	0.92	4.4	
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg	26	4.1	3.8	11	15	1.9	5.7	

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SB-207	SB-208	SB-209	SB-209	SB-210	SB-213	SB-214
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-207-A 8-10	SB-208-A 8-10	SB-209-A 10-12	SB-209-A 8-10	SB-210-A 8-10	SB-213-A 6-8	SB-214-A 6-8
				Sample Date	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013
				Depth Interval	8 - 10 ft	8 - 10 ft	10 - 12 ft	8 - 10 ft	8 - 10 ft	6 - 8 ft	6 - 8 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO VOCs VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg								
RA SO VOCs VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg								
RA SO VOCs VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg								
RA SO VOCs VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg								
RA SO VOCs VPHs	1,1-Dichloroethane	75-34-3	mg/kg								
RA SO VOCs VPHs	1,1-Dichloroethene	75-35-4	mg/kg								
RA SO VOCs VPHs	1,1-Dichloropropene	563-58-6	mg/kg								
RA SO VOCs VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg								
RA SO VOCs VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg								
RA SO VOCs VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA SO VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg								
RA SO VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg								
RA SO VOCs VPHs	1,2-Dibromoethane	106-93-4	mg/kg								
RA SO VOCs VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA SO VOCs VPHs	1,2-Dichloroethane	107-06-2	mg/kg								
RA SO VOCs VPHs	1,2-Dichloropropane	78-87-5	mg/kg								
RA SO VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg								
RA SO VOCs VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA SO VOCs VPHs	1,3-Dichloropropane	142-28-9	mg/kg								
RA SO VOCs VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA SO VOCs VPHs	2,2-Dichloropropane	594-20-7	mg/kg								
RA SO VOCs VPHs	2-Butanone (MEK)	78-93-3	mg/kg								
RA SO VOCs VPHs	2-Chlorotoluene	95-49-8	mg/kg								
RA SO VOCs VPHs	2-Hexanone	591-78-6	mg/kg								
RA SO VOCs VPHs	4-Chlorotoluene	106-43-4	mg/kg								
RA SO VOCs VPHs	4-Isopropyltoluene	99-87-6	mg/kg								
RA SO VOCs VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg								
RA SO VOCs VPHs	Acetone	67-64-1	mg/kg								
RA SO VOCs VPHs	Benzene	71-43-2	mg/kg	0.47 U	0.05 U	0.01 J	0.03 J	0.03 J	0.04 U	0.04 U	
RA SO VOCs VPHs	Bromobenzene	108-86-1	mg/kg								
RA SO VOCs VPHs	Bromochloromethane	74-97-5	mg/kg								
RA SO VOCs VPHs	Bromodichloromethane	75-27-4	mg/kg								
RA SO VOCs VPHs	Bromoform	75-25-2	mg/kg								
RA SO VOCs VPHs	Bromomethane	74-83-9	mg/kg								
RA SO VOCs VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg	70.2 U	31.6	53.3 J	144	85.4 J	6.5 U	27.1 J	
RA SO VOCs VPHs	C5-C8 ALIPHATICS (UNADJUSTED)	C5-C8_ALI_UN	mg/kg	70.2 U	31.9	53.4 J	144	85.5 J	6.5 U	27.1 J	
RA SO VOCs VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg	23.9 J	11.2 J	79.5 J	198	142 J	3.93 J	128 J	
RA SO VOCs VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg	70.2 U	19.4 J	175 J	455	293 J	9.05 J	277 J	
RA SO VOCs VPHs	C9-C12 ALIPHATICS (UNADJUSTED)	C9-C12ALIPH	mg/kg	70.2 U	31.2 J	259 J	664	444 J	13.3 J	410 J	
RA SO VOCs VPHs	Carbon Disulfide	75-15-0	mg/kg								
RA SO VOCs VPHs	Carbon Tetrachloride	56-23-5	mg/kg								
RA SO VOCs VPHs	Chlorobenzene	108-90-7	mg/kg								
RA SO VOCs VPHs	Chloroethane	75-00-3	mg/kg								
RA SO VOCs VPHs	Chloroform	67-66-3	mg/kg								
RA SO VOCs VPHs	Chloromethane	74-87-3	mg/kg								
RA SO VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg								
RA SO VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg								
RA SO VOCs VPHs	dibromochloromethane	124-48-1	mg/kg								
RA SO VOCs VPHs	Dibromomethane	74-95-3	mg/kg								
RA SO VOCs VPHs	Dichlorodifluoromethane	75-71-8	mg/kg								
RA SO VOCs VPHs	Ethylbenzene	100-41-4	mg/kg	0.15 J	0.29 J	3.5 J	9.7	4.21 J	0.08 J	4.22 J	
RA SO VOCs VPHs	Hexachlorobutadiene	87-68-3	mg/kg								
RA SO VOCs VPHs	Isopropylbenzene	98-82-8	mg/kg								

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SB-207	SB-208	SB-209	SB-209	SB-210	SB-213	SB-214
			Sample Type Code	N	N	N	N	N	N	N
			Sample ID	SB-207-A 8-10	SB-208-A 8-10	SB-209-A 10-12	SB-209-A 8-10	SB-210-A 8-10	SB-213-A 6-8	SB-214-A 6-8
			Sample Date	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013	9/18/2013
			Depth Interval	8 - 10 ft	8 - 10 ft	10 - 12 ft	8 - 10 ft	8 - 10 ft	6 - 8 ft	6 - 8 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	0.78 J	0.17 J	0.14 J	0.19 J	4.49 J	0.17 J	0.09 J
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg							
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.47 U	0.05 U	0.04 U	0.06 U	0.04 U	0.04 U	0.04 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg	19.8 J	1.04 J	3.17 J	13.4	13.6 J	0.14 J	4.1 J
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg							
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg							
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	0.47 U	0.1 J	0.41 J	1.46	0.48 J	0.02 J	0.4 J
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg							
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg							
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg							
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg							
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.47 U	0.33 J	0.03 J	0.08 J	0.05 J	0.04 U	0.02 J
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	1.3	0.27	0.55	1.7	5.0	0.19	0.49
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg							
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg							
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg							
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg							
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg							

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SB-216	SB-217	SB-327	SB-328	SB-329	SB-330	SB-330
				Sample Type Code	N	N	N	N	N	N	FD
				Sample ID	SB-216-A 8-10	SB-217-A 8-10	SB-327-CI19-0-1	SB-328-CI19-0-1	SB-329-CI19-0-1	SB-330-CI19-0-1	SB-330-CI19-0-1-DUP
				Sample Date	9/18/2013	9/18/2013	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019
				Depth Interval	8 - 10 ft	8 - 10 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_Metals	Aluminum	7429-90-5	mg/kg			4400	6060	6640	5450	4630	
RA_SO_Metals	Antimony	7440-36-0	mg/kg			0.0380 J	0.0760	0.110	0.0550 J	0.0300 J	
RA_SO_Metals	Arsenic	7440-38-2	mg/kg			1.27	2.00	2.57	1.62	1.30	
RA_SO_Metals	Barium	7440-39-3	mg/kg			14.5	17.6	18.6	23.5	22.0	
RA_SO_Metals	Beryllium	7440-41-7	mg/kg			0.350	0.438	0.502	0.282	0.280	
RA_SO_Metals	Cadmium	7440-43-9	mg/kg			0.0849	0.141	0.221	0.0620 J	0.0580 J	
RA_SO_Metals	Calcium	7440-70-2	mg/kg			636	976	1100	1120	1360	
RA_SO_Metals	Chromium	7440-47-3	mg/kg			4.96	6.05	13.6	5.86	5.01	
RA_SO_Metals	Cobalt	7440-48-4	mg/kg			2.26	2.37	4.15	2.51	2.56	
RA_SO_Metals	Copper	7440-50-8	mg/kg			6.82 J	9.96	10.7	6.89	6.30	
RA_SO_Metals	Iron	7439-89-6	mg/kg			6480	7740	10900	6700	6250	
RA_SO_Metals	Lead	7439-92-1	mg/kg			16.7 J	24.3	28.3	18.5	16.8	
RA_SO_Metals	Magnesium	7439-95-4	mg/kg			1140	1120	4370	1420	1250	
RA_SO_Metals	Manganese	7439-96-5	mg/kg			94.1 J	109	123	126	120	
RA_SO_Metals	Mercury	7439-97-6	mg/kg			0.00950 J	0.0320 J	0.0280 J	0.0140 J	0.0150 J	
RA_SO_Metals	Nickel	7440-02-0	mg/kg			4.15	4.94	22.5	3.92	3.48	
RA_SO_Metals	Potassium	7440-09-7	mg/kg			659	517	589	1040	979	
RA_SO_Metals	Selenium	7782-49-2	mg/kg			0.0810 J	0.190 J	0.200 J	0.120 J	0.0960 J	
RA_SO_Metals	Silver	7440-22-4	mg/kg			0.0310 J	0.0470 J	0.0729 J	0.0250 J	0.0290 J	
RA_SO_Metals	Sodium	7440-23-5	mg/kg			25 U	30 U	35 U	40 U	34 U	
RA_SO_Metals	Thallium	7440-28-0	mg/kg			0.025 U	0.0891	0.0961	0.04 U	0.034 U	
RA_SO_Metals	Vanadium	7440-62-2	mg/kg			7.26	10.8	12.3	10.3	8.72	
RA_SO_Metals	Zinc	7440-66-6	mg/kg			34.0 J	41.1	92.3	28.0	26.8	
RA_SO_Other	Total Organic Carbon	TOC	mg/kg			11000 J			9900	7400	
RA_SO_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg			0.0086 U	0.0096 U	0.009 U	0.0088 U	0.0081 U	
RA_SO_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg			0.0086 U	0.0096 U	0.009 U	0.0088 U	0.0081 U	
RA_SO_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg			0.01 U	0.011 U	0.011 U	0.01 U	0.0095 U	
RA_SO_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg			0.0086 U	0.0096 U	0.009 U	0.0088 U	0.0081 U	
RA_SO_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg			0.0086 U	0.0096 U	0.009 U	0.0088 U	0.0081 U	
RA_SO_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg			0.0086 U	0.0096 U	0.009 U	0.0088 U	0.0081 U	
RA_SO_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg			0.0086 U	0.0096 U	0.19	0.0088 U	0.0081 U	
RA_SO_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg			0.061 U	0.068 U	0.19	0.063 U	0.058 U	
RA_SO_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg			0.062 U	0.069 U	0.25	0.063 U	0.058 U	
RA_SO_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	1-Methylnaphthalene	90-12-0	mg/kg			0.0094 UJ	0.00260 J	0.011 U	0.0340	0.0280	
RA_SO_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg			0.58 U	0.59 U	0.68 U	0.62 U	0.6 U	
RA_SO_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	mg/kg			0.23 UJ	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	mg/kg			0.58 U	0.59 U	0.68 U	0.62 U	0.6 U	
RA_SO_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	2-Chlorophenol	95-57-8	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	2-Methylnaphthalene	91-57-6	mg/kg	1.99	0.18 U	0.0094 UJ	0.00440 J	0.0290	0.0740	0.0560	
RA_SO_SVOCs_EPHs	2-Methylphenol	95-48-7	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	2-Nitroaniline	88-74-4	mg/kg			0.58 U	0.59 U	0.68 U	0.62 U	0.6 U	
RA_SO_SVOCs_EPHs	2-Nitrophenol	88-75-5	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SB-216	SB-217	SB-327	SB-328	SB-329	SB-330	SB-330
				Sample Type Code	N	N	N	N	N	N	FD
				Sample ID	SB-216-A 8-10	SB-217-A 8-10	SB-327-CI19-0-1	SB-328-CI19-0-1	SB-329-CI19-0-1	SB-330-CI19-0-1	SB-330-CI19-0-1-DUP
				Sample Date	9/18/2013	9/18/2013	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019
				Depth Interval	8 - 10 ft	8 - 10 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_SVOCs_EPHs	3-Nitroaniline	99-09-2	mg/kg			0.58 U	0.59 U	0.68 U	0.62 U	0.6 U	
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg			0.58 U	0.59 U	0.68 U	0.62 U	0.6 U	
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg			0.23 UJ	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg			0.58 UJ	0.59 U	0.68 U	0.62 U	0.6 U	
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg			0.58 U	0.59 U	0.68 U	0.62 U	0.6 U	
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg	0.16 U	0.18 U	0.0094 UJ	0.0097 U	0.011 U	0.00940 J	0.00460 J	
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg	0.16 U	0.18 U	0.0094 UJ	0.0097 U	0.011 U	0.15 J	0.0550 J	
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg	0.16 U	0.18 U	0.0094 UJ	0.00450 J	0.00630 J	0.49 J	0.0620 J	
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.16 U	0.18 U	0.00460 J	0.0480	0.0470	3.5	0.71	
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.16 U	0.18 U	0.00730 J	0.0590 J	0.0660 J	3.3 J	0.88 J	
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.16 U	0.18 U	0.00950 J	0.0810	0.0860	3.4	0.95	
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.16 U	0.18 U	0.0180 J	0.0420	0.0670	1.8 J	0.53	
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.16 U	0.18 U	0.00510 J	0.0280	0.0320	1.2 J	0.25	
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg			0.58 UJ	0.59 UJ	0.68 UJ	0.62 UJ	0.6 UJ	
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg			0.47 UJ	0.48 U	0.55 U	0.5 U	0.49 U	
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg			0.23 UJ	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg	120	31.3						
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg	122	31.3						
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg	5.5 U	6 U						
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg	560 J	285 J						
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg	0.16 U	0.18 U	0.00740 J	0.0620	0.0600	2.4	0.66	
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.16 U	0.18 U	0.0094 UJ	0.0120 J	0.0180 J	0.28 J	0.13 J	
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg			0.23 UJ	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg	0.16 U	0.18 U	0.00310 J	0.0670	0.0640	5 J	0.48 J	
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg	0.16 U	0.18 U	0.0094 UJ	0.0097 U	0.011 U	0.0940 J	0.0240 J	
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg			0.23 UJ	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.16 U	0.18 U	0.00470 J	0.0450	0.0730	1.9 J	0.48	
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg	0.25 J	0.18 U	0.0094 UJ	0.0097 U	0.0230	0.11	0.0770	
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg			0.58 U	0.59 U	0.68 U	0.62 U	0.6 U	
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg	0.16 U	0.18 U	0.00210 J	0.0390	0.0400	1.3 J	0.39	
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg			0.23 U	0.24 U	0.28 U	0.25 U	0.24 U	
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg	0.16 U	0.18 U	0.00370 J	0.0770	0.0670	6.6 J	1.1 J	
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	1.6 U	1.8 U	0.069	0.52	0.58	29	6.2	
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	3.0	1.3 U	0.068	0.066	0.12	2.3	0.70	
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg	4.6	3.1 U	0.10	0.59	0.70	32	6.9	

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SB-216	SB-217	SB-327	SB-328	SB-329	SB-330	SB-330
			Sample Type Code	N	N	N	N	N	N	FD
			Sample ID	SB-216-A 8-10	SB-217-A 8-10	SB-327-CI19-0-1	SB-328-CI19-0-1	SB-329-CI19-0-1	SB-330-CI19-0-1	SB-330-CI19-0-1-DUP
			Sample Date	9/18/2013	9/18/2013	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019
			Depth Interval	8 - 10 ft	8 - 10 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units							
RA SO VOCs VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg							
RA SO VOCs VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg							
RA SO VOCs VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg							
RA SO VOCs VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg							
RA SO VOCs VPHs	1,1-Dichloroethane	75-34-3	mg/kg							
RA SO VOCs VPHs	1,1-Dichloroethene	75-35-4	mg/kg							
RA SO VOCs VPHs	1,1-Dichloropropene	563-58-6	mg/kg							
RA SO VOCs VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg							
RA SO VOCs VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg							
RA SO VOCs VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg							
RA SO VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg							
RA SO VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg							
RA SO VOCs VPHs	1,2-Dibromoethane	106-93-4	mg/kg							
RA SO VOCs VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg							
RA SO VOCs VPHs	1,2-Dichloroethane	107-06-2	mg/kg							
RA SO VOCs VPHs	1,2-Dichloropropane	78-87-5	mg/kg							
RA SO VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg							
RA SO VOCs VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg							
RA SO VOCs VPHs	1,3-Dichloropropane	142-28-9	mg/kg							
RA SO VOCs VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg							
RA SO VOCs VPHs	2,2-Dichloropropane	594-20-7	mg/kg							
RA SO VOCs VPHs	2-Butanone (MEK)	78-93-3	mg/kg							
RA SO VOCs VPHs	2-Chlorotoluene	95-49-8	mg/kg							
RA SO VOCs VPHs	2-Hexanone	591-78-6	mg/kg							
RA SO VOCs VPHs	4-Chlorotoluene	106-43-4	mg/kg							
RA SO VOCs VPHs	4-Isopropyltoluene	99-87-6	mg/kg							
RA SO VOCs VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg							
RA SO VOCs VPHs	Acetone	67-64-1	mg/kg							
RA SO VOCs VPHs	Benzene	71-43-2	mg/kg	0.04 U	0.05 U					
RA SO VOCs VPHs	Bromobenzene	108-86-1	mg/kg							
RA SO VOCs VPHs	Bromochloromethane	74-97-5	mg/kg							
RA SO VOCs VPHs	Bromodichloromethane	75-27-4	mg/kg							
RA SO VOCs VPHs	Bromoform	75-25-2	mg/kg							
RA SO VOCs VPHs	Bromomethane	74-83-9	mg/kg							
RA SO VOCs VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg	68.2 J	26.2					
RA SO VOCs VPHs	C5-C8 ALIPHATICS (UNADJUSTED)	C5-C8_ALI_UN	mg/kg	68.2 J	26.2					
RA SO VOCs VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg	200 J	58.1 J					
RA SO VOCs VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg	414 J	126 J					
RA SO VOCs VPHs	C9-C12 ALIPHATICS (UNADJUSTED)	C9-C12ALIPH	mg/kg	618 J	186 J					
RA SO VOCs VPHs	Carbon Disulfide	75-15-0	mg/kg							
RA SO VOCs VPHs	Carbon Tetrachloride	56-23-5	mg/kg							
RA SO VOCs VPHs	Chlorobenzene	108-90-7	mg/kg							
RA SO VOCs VPHs	Chloroethane	75-00-3	mg/kg							
RA SO VOCs VPHs	Chloroform	67-66-3	mg/kg							
RA SO VOCs VPHs	Chloromethane	74-87-3	mg/kg							
RA SO VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg							
RA SO VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg							
RA SO VOCs VPHs	dibromochloromethane	124-48-1	mg/kg							
RA SO VOCs VPHs	Dibromomethane	74-95-3	mg/kg							
RA SO VOCs VPHs	Dichlorodifluoromethane	75-71-8	mg/kg							
RA SO VOCs VPHs	Ethylbenzene	100-41-4	mg/kg	1.97 J	0.99 J					
RA SO VOCs VPHs	Hexachlorobutadiene	87-68-3	mg/kg							
RA SO VOCs VPHs	Isopropylbenzene	98-82-8	mg/kg							

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SB-216	SB-217	SB-327	SB-328	SB-329	SB-330	SB-330
			Sample Type Code	N	N	N	N	N	N	FD
			Sample ID	SB-216-A 8-10	SB-217-A 8-10	SB-327-CI19-0-1	SB-328-CI19-0-1	SB-329-CI19-0-1	SB-330-CI19-0-1	SB-330-CI19-0-1-DUP
			Sample Date	9/18/2013	9/18/2013	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019
			Depth Interval	8 - 10 ft	8 - 10 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg	0.27 J	0.28 J					
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg							
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.04 U	0.05 U					
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg	6.78 J	1.53 J					
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg							
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg							
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg	1.15 J	0.38 J					
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg							
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg							
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg							
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg							
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg	0.04 UJ	0.02 J					
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg	1.4	0.66					
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg							
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg							
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg							
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg							
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg							

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SB-331	SB-332	SB-333	SB-334	SB-335	SB-336	SS-1A
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-331-CI19-0-1	SB-332-CI19-0-1	SB-333-CI19-0-1	SB-334-CI19-0-1	SB-335-CI19-0-1	SB-336-CI19-0-1	SS-1A 0-1
				Sample Date	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019	11/30/2011
				Depth Interval	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SO_Metals	Aluminum	7429-90-5	mg/kg	5460	5790	4270	4920	5090	2660	
RA_SO_Metals	Antimony	7440-36-0	mg/kg	0.110	0.0550 J	0.158	0.0520 J	0.0320 J	0.0290 J	
RA_SO_Metals	Arsenic	7440-38-2	mg/kg	1.66	2.02	1.43	1.68	1.30	0.990	3.9
RA_SO_Metals	Barium	7440-39-3	mg/kg	32.4	18.1	9.92	11.3	8.22	4.27	10.3
RA_SO_Metals	Beryllium	7440-41-7	mg/kg	0.344	0.629	0.397	0.386	0.381	0.260	
RA_SO_Metals	Cadmium	7440-43-9	mg/kg	0.146	0.0845 J	0.293	0.0580 J	0.0850 J	0.0270 J	0.1 J
RA_SO_Metals	Calcium	7440-70-2	mg/kg	933	691	335	414	358	353	
RA_SO_Metals	Chromium	7440-47-3	mg/kg	5.46	6.39	6.80	4.37	4.06	2.57	4.6
RA_SO_Metals	Cobalt	7440-48-4	mg/kg	3.36	3.27	2.69	1.83	1.49	1.52	
RA_SO_Metals	Copper	7440-50-8	mg/kg	9.18	9.14	9.41	4.66	3.69	2.82	
RA_SO_Metals	Iron	7439-89-6	mg/kg	9070	9340	7560	6460	5930	4480	
RA_SO_Metals	Lead	7439-92-1	mg/kg	28.8	21.1	37.8	11.8	13.2	11.5	22.6
RA_SO_Metals	Magnesium	7439-95-4	mg/kg	1460	1600	896	690	634	500	
RA_SO_Metals	Manganese	7439-96-5	mg/kg	197	115	90.7	80.4	60.9	64.1	
RA_SO_Metals	Mercury	7439-97-6	mg/kg	0.0300 J	0.0260 J	0.0270 J	0.0160 J	0.0210 J	0.00910 J	0.049
RA_SO_Metals	Nickel	7440-02-0	mg/kg	4.70	6.11	4.94	3.41	3.36	2.26	
RA_SO_Metals	Potassium	7440-09-7	mg/kg	1660	767	345	422	242	244	
RA_SO_Metals	Selenium	7782-49-2	mg/kg	0.110 J	0.130 J	0.130 J	0.120 J	0.120 J	0.0720 J	5.1 U
RA_SO_Metals	Silver	7440-22-4	mg/kg	0.184	0.0460 J	0.0592 J	0.0330 J	0.0220 J	0.0462 J	0.5 U
RA_SO_Metals	Sodium	7440-23-5	mg/kg	32 U	36 U	26 U	32 U	38 U	24 U	
RA_SO_Metals	Thallium	7440-28-0	mg/kg	0.110	0.036 U	0.026 U	0.0650 J	0.038 U	0.024 U	
RA_SO_Metals	Vanadium	7440-62-2	mg/kg	10.3	14.7	8.31	7.53	6.79	5.55	
RA_SO_Metals	Zinc	7440-66-6	mg/kg	90.0	37.6	38.0	22.9	18.8	15.4	
RA_SO_Other	Total Organic Carbon	TOC	mg/kg				14000		10000	
RA_SO_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.0087 U	0.0087 U	0.0082 U	0.0084 U		0.0085 U	
RA_SO_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.0087 U	0.0087 U	0.0082 U	0.0084 U		0.0085 U	
RA_SO_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.01 U	0.01 U	0.0097 U	0.0099 U		0.01 U	
RA_SO_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.0087 U	0.0087 U	0.0082 U	0.0084 U		0.0085 U	
RA_SO_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.0087 U	0.0087 U	0.0082 U	0.0084 U		0.0085 U	
RA_SO_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.0087 U	0.0087 U	0.0082 U	0.0084 U		0.0085 U	
RA_SO_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.0800	0.0087 U	0.0560	0.0084 U		0.0085 U	
RA_SO_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.0800 J	0.062 U	0.0560 J	0.06 U		0.061 U	
RA_SO_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.13	0.062 U	0.11	0.060 U		0.061 U	
RA_SO_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	1-Methylnaphthalene	90-12-0	mg/kg	0.0120 J	0.00440 J	0.00250 J	0.0098 UJ	0.01 UJ	0.01 UJ	
RA_SO_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg	0.57 U	0.6 U	0.6 U	0.6 U	0.61 U	0.62 U	
RA_SO_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	mg/kg	0.57 U	0.6 U	0.6 U	0.6 U	0.61 U	0.62 U	
RA_SO_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	2-Chlorophenol	95-57-8	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.0220	0.00810 J	0.00350 J	0.0098 UJ	0.01 UJ	0.01 UJ	
RA_SO_SVOCs_EPHs	2-Methylphenol	95-48-7	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	2-Nitroaniline	88-74-4	mg/kg	0.57 U	0.6 U	0.6 U	0.6 U	0.61 U	0.62 U	
RA_SO_SVOCs_EPHs	2-Nitrophenol	88-75-5	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA_SO_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	

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BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SB-331	SB-332	SB-333	SB-334	SB-335	SB-336	SS-1A
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SB-331-CI19-0-1	SB-332-CI19-0-1	SB-333-CI19-0-1	SB-334-CI19-0-1	SB-335-CI19-0-1	SB-336-CI19-0-1	SS-1A 0-1
				Sample Date	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019	11/30/2011
				Depth Interval	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO SVOCs EPHs	3-Nitroaniline	99-09-2	mg/kg	0.57 U	0.6 U	0.6 U	0.6 U	0.6 U	0.61 U	0.62 U	
RA SO SVOCs EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	0.57 U	0.6 U	0.6 U	0.6 U	0.6 U	0.61 U	0.62 U	
RA SO SVOCs EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA SO SVOCs EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA SO SVOCs EPHs	4-Chloroaniline	106-47-8	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA SO SVOCs EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	
RA SO SVOCs EPHs	4-Nitroaniline	100-01-6	mg/kg	0.57 U	0.6 U	0.6 U	0.6 U	0.6 U	0.61 U	0.62 U	
RA SO SVOCs EPHs	4-Nitrophenol	100-02-7	mg/kg	0.57 U	0.6 U	0.6 U	0.6 U	0.6 U	0.61 U	0.62 U	
RA SO SVOCs EPHs	Acenaphthene	83-32-9	mg/kg	0.0130 J	0.0097 UJ	0.0098 UJ	0.0098 UJ	0.0098 UJ	0.01 UJ	0.01 UJ	
RA SO SVOCs EPHs	Acenaphthylene	208-96-8	mg/kg	0.0290	0.00980 J	0.0098 UJ	0.0098 UJ	0.0098 UJ	0.01 UJ	0.01 UJ	
RA SO SVOCs EPHs	Anthracene	120-12-7	mg/kg	0.0590 J	0.0110 J	0.00310 J	0.0098 UJ	0.01 UJ	0.01 UJ	0.01 UJ	
RA SO SVOCs EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.38	0.0950 J	0.0210 J	0.00920 J	0.00590 J	0.00630 J		
RA SO SVOCs EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.58 J	0.15 J	0.0290 J	0.0120 J	0.00870 J	0.0110 J		
RA SO SVOCs EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.63 J	0.14 J	0.0460 J	0.0230 J	0.0170 J	0.0180 J		
RA SO SVOCs EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.36	0.12 J	0.0280 J	0.0100 J	0.00760 J	0.00840 J		
RA SO SVOCs EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.2	0.0630 J	0.0180 J	0.00920 J	0.00730 J	0.00780 J		
RA SO SVOCs EPHs	Benzoic acid	65-85-0	mg/kg	0.57 UJ	0.6 UJ	0.6 UJ	0.6 UJ	0.61 UJ	0.62 UJ		
RA SO SVOCs EPHs	Benzyl Alcohol	100-51-6	mg/kg	0.46 U	0.48 U	0.49 U	0.48 U	0.49 U	0.5 U		
RA SO SVOCs EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg								
RA SO SVOCs EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg								
RA SO SVOCs EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg								
RA SO SVOCs EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg								
RA SO SVOCs EPHs	Carbazole	86-74-8	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Chrysene	218-01-9	mg/kg	0.42	0.13 J	0.0310 J	0.0130 J	0.00880 J	0.00900 J		
RA SO SVOCs EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.0930	0.0320 J	0.00900 J	0.00320 J	0.01 UJ	0.01 UJ		
RA SO SVOCs EPHs	Dibenzofuran	132-64-9	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Diethyl Phthalate	84-66-2	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Dimethyl Phthalate	131-11-3	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Fluoranthene	206-44-0	mg/kg	0.52 J	0.0860 J	0.0370 J	0.0160 J	0.0120 J	0.0140 J		
RA SO SVOCs EPHs	Fluorene	86-73-7	mg/kg	0.0250	0.00490 J	0.0098 UJ	0.0098 UJ	0.01 UJ	0.01 UJ		
RA SO SVOCs EPHs	Hexachlorobenzene	118-74-1	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Hexachloroethane	67-72-1	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.32	0.0920 J	0.0210 J	0.00880 J	0.00670 J	0.00530 J		
RA SO SVOCs EPHs	Isophorone	78-59-1	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Naphthalene	91-20-3	mg/kg	0.0310	0.0130 J	0.0098 UJ	0.0098 UJ	0.01 UJ	0.01 UJ		
RA SO SVOCs EPHs	Nitrobenzene	98-95-3	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Pentachlorophenol	87-86-5	mg/kg	0.57 U	0.6 U	0.6 U	0.6 U	0.61 U	0.62 U		
RA SO SVOCs EPHs	Phenanthrene	85-01-8	mg/kg	0.4	0.0770 J	0.0280 J	0.00800 J	0.00520 J	0.00680 J		
RA SO SVOCs EPHs	Phenol	108-95-2	mg/kg	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U		
RA SO SVOCs EPHs	Pyrene	129-00-0	mg/kg	1.2 J	0.38 J	0.0510 J	0.0100 J	0.00650 J	0.0120 J		
RA SO SVOCs EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	4.7	1.3	0.29	0.11	0.088	0.099		
RA SO SVOCs EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.59	0.13	0.050	0.077	0.075	0.077		
RA SO SVOCs EPHs	Total PAHs (b)	Tot-PAH	mg/kg	5.3	1.4	0.35	0.18	0.14	0.16		

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SB-331	SB-332	SB-333	SB-334	SB-335	SB-336	SS-1A
			Sample Type Code	N	N	N	N	N	N	N
			Sample ID	SB-331-CI19-0-1	SB-332-CI19-0-1	SB-333-CI19-0-1	SB-334-CI19-0-1	SB-335-CI19-0-1	SB-336-CI19-0-1	SS-1A 0-1
			Sample Date	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019	11/30/2011
			Depth Interval	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units							
RA SO VOCs VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg							
RA SO VOCs VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg							
RA SO VOCs VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg							
RA SO VOCs VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg							
RA SO VOCs VPHs	1,1-Dichloroethane	75-34-3	mg/kg							
RA SO VOCs VPHs	1,1-Dichloroethene	75-35-4	mg/kg							
RA SO VOCs VPHs	1,1-Dichloropropene	563-58-6	mg/kg							
RA SO VOCs VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg							
RA SO VOCs VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg							
RA SO VOCs VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg							
RA SO VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg							
RA SO VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg							
RA SO VOCs VPHs	1,2-Dibromoethane	106-93-4	mg/kg							
RA SO VOCs VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg							
RA SO VOCs VPHs	1,2-Dichloroethane	107-06-2	mg/kg							
RA SO VOCs VPHs	1,2-Dichloropropane	78-87-5	mg/kg							
RA SO VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg							
RA SO VOCs VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg							
RA SO VOCs VPHs	1,3-Dichloropropane	142-28-9	mg/kg							
RA SO VOCs VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg							
RA SO VOCs VPHs	2,2-Dichloropropane	594-20-7	mg/kg							
RA SO VOCs VPHs	2-Butanone (MEK)	78-93-3	mg/kg							
RA SO VOCs VPHs	2-Chlorotoluene	95-49-8	mg/kg							
RA SO VOCs VPHs	2-Hexanone	591-78-6	mg/kg							
RA SO VOCs VPHs	4-Chlorotoluene	106-43-4	mg/kg							
RA SO VOCs VPHs	4-Isopropyltoluene	99-87-6	mg/kg							
RA SO VOCs VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg							
RA SO VOCs VPHs	Acetone	67-64-1	mg/kg							
RA SO VOCs VPHs	Benzene	71-43-2	mg/kg							
RA SO VOCs VPHs	Bromobenzene	108-86-1	mg/kg							
RA SO VOCs VPHs	Bromochloromethane	74-97-5	mg/kg							
RA SO VOCs VPHs	Bromodichloromethane	75-27-4	mg/kg							
RA SO VOCs VPHs	Bromoform	75-25-2	mg/kg							
RA SO VOCs VPHs	Bromomethane	74-83-9	mg/kg							
RA SO VOCs VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg							
RA SO VOCs VPHs	C5-C8 ALIPHATICS (UNADJUSTED)	C5-C8_ALI_UN	mg/kg							
RA SO VOCs VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg							
RA SO VOCs VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg							
RA SO VOCs VPHs	C9-C12 ALIPHATICS (UNADJUSTED)	C9-C12ALIPH	mg/kg							
RA SO VOCs VPHs	Carbon Disulfide	75-15-0	mg/kg							
RA SO VOCs VPHs	Carbon Tetrachloride	56-23-5	mg/kg							
RA SO VOCs VPHs	Chlorobenzene	108-90-7	mg/kg							
RA SO VOCs VPHs	Chloroethane	75-00-3	mg/kg							
RA SO VOCs VPHs	Chloroform	67-66-3	mg/kg							
RA SO VOCs VPHs	Chloromethane	74-87-3	mg/kg							
RA SO VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg							
RA SO VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg							
RA SO VOCs VPHs	dibromochloromethane	124-48-1	mg/kg							
RA SO VOCs VPHs	Dibromomethane	74-95-3	mg/kg							
RA SO VOCs VPHs	Dichlorodifluoromethane	75-71-8	mg/kg							
RA SO VOCs VPHs	Ethylbenzene	100-41-4	mg/kg							
RA SO VOCs VPHs	Hexachlorobutadiene	87-68-3	mg/kg							
RA SO VOCs VPHs	Isopropylbenzene	98-82-8	mg/kg							

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SB-331	SB-332	SB-333	SB-334	SB-335	SB-336	SS-1A
			Sample Type Code	N	N	N	N	N	N	N
			Sample ID	SB-331-CI19-0-1	SB-332-CI19-0-1	SB-333-CI19-0-1	SB-334-CI19-0-1	SB-335-CI19-0-1	SB-336-CI19-0-1	SS-1A 0-1
			Sample Date	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019	11/30/2011
			Depth Interval	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg							
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg							
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg							
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg							
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg							
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg							
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg							
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg							
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg							
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg							
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg							
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg							
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg							
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg							
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg							
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg							
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg							
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg							

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SS-1A	SS-1A	SS-2A	SS-2A	SS-3A	SS-3A	SS-3A
				Sample Type Code	N	FD	N	N	N	N	FD
				Sample ID	SS-1A 1-2	SS-1A 1-2DUP	SS-2A 0-1	SS-2A 1-2	SS-3A 0-1	SS-3A 1-2	SS-3AD 1-2
				Sample Date	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011
				Depth Interval	1 - 2 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO Metals	Aluminum	7429-90-5	mg/kg								
RA SO Metals	Antimony	7440-36-0	mg/kg								
RA SO Metals	Arsenic	7440-38-2	mg/kg	5.8		3.6	3.3	4.2	3.5	2.9	
RA SO Metals	Barium	7440-39-3	mg/kg	10.6		6.4	5.2	6.8	6.7	6.6	
RA SO Metals	Beryllium	7440-41-7	mg/kg								
RA SO Metals	Cadmium	7440-43-9	mg/kg	0.5 U		0.5 U	0.5 U	0.07 J	0.5 U	0.5 U	
RA SO Metals	Calcium	7440-70-2	mg/kg								
RA SO Metals	Chromium	7440-47-3	mg/kg	6.2		3.1	2.4	4.7	2.9	2.6	
RA SO Metals	Cobalt	7440-48-4	mg/kg								
RA SO Metals	Copper	7440-50-8	mg/kg								
RA SO Metals	Iron	7439-89-6	mg/kg								
RA SO Metals	Lead	7439-92-1	mg/kg	20.1		16.7	6.4	24.5	4.3 J	3.8 J	
RA SO Metals	Magnesium	7439-95-4	mg/kg								
RA SO Metals	Manganese	7439-96-5	mg/kg								
RA SO Metals	Mercury	7439-97-6	mg/kg	0.032 J	0.0365	0.036 U	0.035 U	0.02 J	0.032 U	0.033 U	
RA SO Metals	Nickel	7440-02-0	mg/kg								
RA SO Metals	Potassium	7440-09-7	mg/kg								
RA SO Metals	Selenium	7782-49-2	mg/kg	5 U		5.3 U	5 U	4.8 U	5.3 U	4.8 U	
RA SO Metals	Silver	7440-22-4	mg/kg	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	
RA SO Metals	Sodium	7440-23-5	mg/kg								
RA SO Metals	Thallium	7440-28-0	mg/kg								
RA SO Metals	Vanadium	7440-62-2	mg/kg								
RA SO Metals	Zinc	7440-66-6	mg/kg								
RA SO Other	Total Organic Carbon	TOC	mg/kg								
RA SO Pest PCBs	Aroclor 1016	12674-11-2	mg/kg								
RA SO Pest PCBs	Aroclor 1221	11104-28-2	mg/kg								
RA SO Pest PCBs	Aroclor 1232	11141-16-5	mg/kg								
RA SO Pest PCBs	Aroclor 1242	53469-21-9	mg/kg								
RA SO Pest PCBs	Aroclor 1248	12672-29-6	mg/kg								
RA SO Pest PCBs	Aroclor 1254	11097-69-1	mg/kg								
RA SO Pest PCBs	Aroclor 1260	11096-82-5	mg/kg								
RA SO Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg								
RA SO Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg								
RA SO SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA SO SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA SO SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA SO SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg								
RA SO SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg								
RA SO SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg								
RA SO SVOCs EPHs	2,4-Dichlorophenol	120-83-2	mg/kg								
RA SO SVOCs EPHs	2,4-Dimethylphenol	105-67-9	mg/kg								
RA SO SVOCs EPHs	2,4-Dinitrophenol	51-28-5	mg/kg								
RA SO SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg								
RA SO SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg								
RA SO SVOCs EPHs	2-Chloronaphthalene	91-58-7	mg/kg								
RA SO SVOCs EPHs	2-Chlorophenol	95-57-8	mg/kg								
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg								
RA SO SVOCs EPHs	2-Methylphenol	95-48-7	mg/kg								
RA SO SVOCs EPHs	2-Nitroaniline	88-74-4	mg/kg								
RA SO SVOCs EPHs	2-Nitrophenol	88-75-5	mg/kg								
RA SO SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg								
RA SO SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg								

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SS-1A	SS-1A	SS-2A	SS-2A	SS-3A	SS-3A	SS-3A
				Sample Type Code	N	FD	N	N	N	N	FD
				Sample ID	SS-1A 1-2	SS-1A 1-2DUP	SS-2A 0-1	SS-2A 1-2	SS-3A 0-1	SS-3A 1-2	SS-3AD 1-2
				Sample Date	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011
				Depth Interval	1 - 2 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO SVOCs EPHs	3-Nitroaniline	99-09-2	mg/kg								
RA SO SVOCs EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg								
RA SO SVOCs EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg								
RA SO SVOCs EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg								
RA SO SVOCs EPHs	4-Chloroaniline	106-47-8	mg/kg								
RA SO SVOCs EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg								
RA SO SVOCs EPHs	4-Nitroaniline	100-01-6	mg/kg								
RA SO SVOCs EPHs	4-Nitrophenol	100-02-7	mg/kg								
RA SO SVOCs EPHs	Acenaphthene	83-32-9	mg/kg								
RA SO SVOCs EPHs	Acenaphthylene	208-96-8	mg/kg								
RA SO SVOCs EPHs	Anthracene	120-12-7	mg/kg								
RA SO SVOCs EPHs	Benzo(a)anthracene	56-55-3	mg/kg								
RA SO SVOCs EPHs	Benzo(a)Pyrene	50-32-8	mg/kg								
RA SO SVOCs EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg								
RA SO SVOCs EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg								
RA SO SVOCs EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg								
RA SO SVOCs EPHs	Benzoic acid	65-85-0	mg/kg								
RA SO SVOCs EPHs	Benzyl Alcohol	100-51-6	mg/kg								
RA SO SVOCs EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg								
RA SO SVOCs EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg								
RA SO SVOCs EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg								
RA SO SVOCs EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg								
RA SO SVOCs EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg								
RA SO SVOCs EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg								
RA SO SVOCs EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg								
RA SO SVOCs EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg								
RA SO SVOCs EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg								
RA SO SVOCs EPHs	Carbazole	86-74-8	mg/kg								
RA SO SVOCs EPHs	Chrysene	218-01-9	mg/kg								
RA SO SVOCs EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg								
RA SO SVOCs EPHs	Dibenzofuran	132-64-9	mg/kg								
RA SO SVOCs EPHs	Diethyl Phthalate	84-66-2	mg/kg								
RA SO SVOCs EPHs	Dimethyl Phthalate	131-11-3	mg/kg								
RA SO SVOCs EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg								
RA SO SVOCs EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg								
RA SO SVOCs EPHs	Fluoranthene	206-44-0	mg/kg								
RA SO SVOCs EPHs	Fluorene	86-73-7	mg/kg								
RA SO SVOCs EPHs	Hexachlorobenzene	118-74-1	mg/kg								
RA SO SVOCs EPHs	Hexachloroethane	67-72-1	mg/kg								
RA SO SVOCs EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg								
RA SO SVOCs EPHs	Isophorone	78-59-1	mg/kg								
RA SO SVOCs EPHs	Naphthalene	91-20-3	mg/kg								
RA SO SVOCs EPHs	Nitrobenzene	98-95-3	mg/kg								
RA SO SVOCs EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg								
RA SO SVOCs EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg								
RA SO SVOCs EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg								
RA SO SVOCs EPHs	Pentachlorophenol	87-86-5	mg/kg								
RA SO SVOCs EPHs	Phenanthrene	85-01-8	mg/kg								
RA SO SVOCs EPHs	Phenol	108-95-2	mg/kg								
RA SO SVOCs EPHs	Pyrene	129-00-0	mg/kg								
RA SO SVOCs EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg								
RA SO SVOCs EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg								
RA SO SVOCs EPHs	Total PAHs (b)	Tot-PAH	mg/kg								

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SS-1A	SS-1A	SS-2A	SS-2A	SS-3A	SS-3A	SS-3A
				Sample Type Code	N	FD	N	N	N	N	FD
				Sample ID	SS-1A 1-2	SS-1A 1-2DUP	SS-2A 0-1	SS-2A 1-2	SS-3A 0-1	SS-3A 1-2	SS-3AD 1-2
				Sample Date	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011
				Depth Interval	1 - 2 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA SO VOCs VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,1-Dichloroethane	75-34-3	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,1-Dichloroethene	75-35-4	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,1-Dichloropropene	563-58-6	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,2-Dibromoethane	106-93-4	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,2-Dichloroethane	107-06-2	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,2-Dichloropropane	78-87-5	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,3-Dichloropropane	142-28-9	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	2,2-Dichloropropane	594-20-7	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	2-Butanone (MEK)	78-93-3	mg/kg						0.0379 U	0.0618 U	0.0482 U
RA SO VOCs VPHs	2-Chlorotoluene	95-49-8	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	2-Hexanone	591-78-6	mg/kg						0.0379 U	0.0618 U	0.0482 U
RA SO VOCs VPHs	4-Chlorotoluene	106-43-4	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	4-Isopropyltoluene	99-87-6	mg/kg						0.0033 J	0.0062 U	0.0048 U
RA SO VOCs VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg						0.0379 U	0.0618 U	0.0482 U
RA SO VOCs VPHs	Acetone	67-64-1	mg/kg						0.0379 U	0.0618 U	0.0482 U
RA SO VOCs VPHs	Benzene	71-43-2	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Bromobenzene	108-86-1	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Bromochloromethane	74-97-5	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Bromodichloromethane	75-27-4	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Bromoform	75-25-2	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Bromomethane	74-83-9	mg/kg						0.0076 U	0.0124 U	0.0096 U
RA SO VOCs VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg								
RA SO VOCs VPHs	C5-C8 ALIPHATICS (UNADJUSTED)	C5-C8_ALI_UN	mg/kg								
RA SO VOCs VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg								
RA SO VOCs VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg								
RA SO VOCs VPHs	C9-C12 ALIPHATICS (UNADJUSTED)	C9-C12ALIPH	mg/kg								
RA SO VOCs VPHs	Carbon Disulfide	75-15-0	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Carbon Tetrachloride	56-23-5	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Chlorobenzene	108-90-7	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Chloroethane	75-00-3	mg/kg						0.0076 U	0.0124 U	0.0096 U
RA SO VOCs VPHs	Chloroform	67-66-3	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Chloromethane	74-87-3	mg/kg						0.0076 U	0.0124 U	0.0096 U
RA SO VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	dibromochloromethane	124-48-1	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Dibromomethane	74-95-3	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Dichlorodifluoromethane	75-71-8	mg/kg						0.0076 U	0.0124 U	0.0096 U
RA SO VOCs VPHs	Ethylbenzene	100-41-4	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Hexachlorobutadiene	87-68-3	mg/kg						0.0038 U	0.0062 U	0.0048 U
RA SO VOCs VPHs	Isopropylbenzene	98-82-8	mg/kg						0.0038 U	0.0062 U	0.0048 U

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Off-Project Red Maple Swamp / Tidal Stream	Off-Project Red Maple Swamp / Tidal Stream	Off-Project Red Maple Swamp / Tidal Stream	Off-Project Red Maple Swamp / Tidal Stream	Off-Project Red Maple Swamp / Tidal Stream	Off-Project Red Maple Swamp / Tidal Stream	Off-Project Red Maple Swamp / Tidal Stream
			Location Group	Area	Area	Area	Area	Area	Area	Area
			Location ID	SS-1A	SS-1A	SS-2A	SS-2A	SS-3A	SS-3A	SS-3A
			Sample Type Code	N	FD	N	N	N	N	FD
			Sample ID	SS-1A 1-2	SS-1A 1-2DUP	SS-2A 0-1	SS-2A 1-2	SS-3A 0-1	SS-3A 1-2	SS-3AD 1-2
			Sample Date	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011
			Depth Interval	1 - 2 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg					0.0076 U	0.0124 U	0.0096 U
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg					0.0189 U	0.0309 U	0.0241 U
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg					3.8 U	6.2 U	4.8 U
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg					0.011 U	0.019 U	0.014 U
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg					0.0038 U	0.0062 U	0.0048 U
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg					0.0076 U	0.0124 U	0.0096 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SS-4A	SS-4A	SS-5A	SS-5A	SS-6A	SS-6A
			Sample Type Code	N	N	N	N	N	N
			Sample ID	SS-4A 0-1	SS-4A 1-2	SS-5A 0-1	SS-5A 1-2	SS-6A 0-1	SS-6A 1-2
			Sample Date	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011
			Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units						
RA_SO_Metals	Aluminum	7429-90-5	mg/kg						
RA_SO_Metals	Antimony	7440-36-0	mg/kg						
RA_SO_Metals	Arsenic	7440-38-2	mg/kg	3.5	4	3.9	2.9	4.2	7.6
RA_SO_Metals	Barium	7440-39-3	mg/kg	10.1	8.9	14.6	16	9.5	11.6
RA_SO_Metals	Beryllium	7440-41-7	mg/kg						
RA_SO_Metals	Cadmium	7440-43-9	mg/kg	0.5 U	0.6 U	0.5 U	0.1 J	0.5 U	0.09 J
RA_SO_Metals	Calcium	7440-70-2	mg/kg						
RA_SO_Metals	Chromium	7440-47-3	mg/kg	5	4.1	3.1	5.1	4	7
RA_SO_Metals	Cobalt	7440-48-4	mg/kg						
RA_SO_Metals	Copper	7440-50-8	mg/kg						
RA_SO_Metals	Iron	7439-89-6	mg/kg						
RA_SO_Metals	Lead	7439-92-1	mg/kg	23.2	12.6	9	34.1	18.6	28.7
RA_SO_Metals	Magnesium	7439-95-4	mg/kg						
RA_SO_Metals	Manganese	7439-96-5	mg/kg						
RA_SO_Metals	Mercury	7439-97-6	mg/kg	0.029 J	0.014 J	0.031 U	0.034	0.033 U	0.037 U
RA_SO_Metals	Nickel	7440-02-0	mg/kg						
RA_SO_Metals	Potassium	7440-09-7	mg/kg						
RA_SO_Metals	Selenium	7782-49-2	mg/kg	4.8 U	5.6 U	5.1 U	4.1 U	4.7 U	5 U
RA_SO_Metals	Silver	7440-22-4	mg/kg	0.5 U	0.6 U	0.5 U	0.4 U	0.5 U	0.5 U
RA_SO_Metals	Sodium	7440-23-5	mg/kg						
RA_SO_Metals	Thallium	7440-28-0	mg/kg						
RA_SO_Metals	Vanadium	7440-62-2	mg/kg						
RA_SO_Metals	Zinc	7440-66-6	mg/kg						
RA_SO_Other	Total Organic Carbon	TOC	mg/kg						
RA_SO_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg						
RA_SO_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg						
RA_SO_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg						
RA_SO_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg						
RA_SO_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg						
RA_SO_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg						
RA_SO_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg						
RA_SO_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg						
RA_SO_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg						
RA_SO_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg						
RA_SO_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	mg/kg						
RA_SO_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	mg/kg						
RA_SO_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	mg/kg						
RA_SO_SVOCs_EPHs	1-Methylnaphthalene	90-12-0	mg/kg						
RA_SO_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	mg/kg						
RA_SO_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	mg/kg						
RA_SO_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	mg/kg						
RA_SO_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	mg/kg						
RA_SO_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	mg/kg						
RA_SO_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	mg/kg						
RA_SO_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	mg/kg						
RA_SO_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	mg/kg						
RA_SO_SVOCs_EPHs	2-Chlorophenol	95-57-8	mg/kg						
RA_SO_SVOCs_EPHs	2-Methylnaphthalene	91-57-6	mg/kg						
RA_SO_SVOCs_EPHs	2-Methylphenol	95-48-7	mg/kg						
RA_SO_SVOCs_EPHs	2-Nitroaniline	88-74-4	mg/kg						
RA_SO_SVOCs_EPHs	2-Nitrophenol	88-75-5	mg/kg						
RA_SO_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	mg/kg						
RA_SO_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	mg/kg						

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SS-4A	SS-4A	SS-5A	SS-5A	SS-6A	SS-6A
			Sample Type Code	N	N	N	N	N	N
			Sample ID	SS-4A 0-1	SS-4A 1-2	SS-5A 0-1	SS-5A 1-2	SS-6A 0-1	SS-6A 1-2
			Sample Date	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011
			Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units						
RA_SO_SVOCs_EPHs	3-Nitroaniline	99-09-2	mg/kg						
RA_SO_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg						
RA_SO_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	mg/kg						
RA_SO_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	mg/kg						
RA_SO_SVOCs_EPHs	4-Chloroaniline	106-47-8	mg/kg						
RA_SO_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg						
RA_SO_SVOCs_EPHs	4-Nitroaniline	100-01-6	mg/kg						
RA_SO_SVOCs_EPHs	4-Nitrophenol	100-02-7	mg/kg						
RA_SO_SVOCs_EPHs	Acenaphthene	83-32-9	mg/kg						
RA_SO_SVOCs_EPHs	Acenaphthylene	208-96-8	mg/kg						
RA_SO_SVOCs_EPHs	Anthracene	120-12-7	mg/kg						
RA_SO_SVOCs_EPHs	Benzo(a)anthracene	56-55-3	mg/kg						
RA_SO_SVOCs_EPHs	Benzo(a)Pyrene	50-32-8	mg/kg						
RA_SO_SVOCs_EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg						
RA_SO_SVOCs_EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg						
RA_SO_SVOCs_EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg						
RA_SO_SVOCs_EPHs	Benzoic acid	65-85-0	mg/kg						
RA_SO_SVOCs_EPHs	Benzyl Alcohol	100-51-6	mg/kg						
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg						
RA_SO_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg						
RA_SO_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg						
RA_SO_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg						
RA_SO_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	mg/kg						
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (ADJUSTED)	C11-C22AROM	mg/kg						
RA_SO_SVOCs_EPHs	C11-C22 AROMATICS (UNADJUSTED)	C11-C22AROMUN	mg/kg						
RA_SO_SVOCs_EPHs	C19-C36 ALIPHATICS	C19-C36ALIPH	mg/kg						
RA_SO_SVOCs_EPHs	C9-C18 ALIPHATICS	C9-C18ALIPH	mg/kg						
RA_SO_SVOCs_EPHs	Carbazole	86-74-8	mg/kg						
RA_SO_SVOCs_EPHs	Chrysene	218-01-9	mg/kg						
RA_SO_SVOCs_EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg						
RA_SO_SVOCs_EPHs	Dibenzofuran	132-64-9	mg/kg						
RA_SO_SVOCs_EPHs	Diethyl Phthalate	84-66-2	mg/kg						
RA_SO_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	mg/kg						
RA_SO_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	mg/kg						
RA_SO_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	mg/kg						
RA_SO_SVOCs_EPHs	Fluoranthene	206-44-0	mg/kg						
RA_SO_SVOCs_EPHs	Fluorene	86-73-7	mg/kg						
RA_SO_SVOCs_EPHs	Hexachlorobenzene	118-74-1	mg/kg						
RA_SO_SVOCs_EPHs	Hexachloroethane	67-72-1	mg/kg						
RA_SO_SVOCs_EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg						
RA_SO_SVOCs_EPHs	Isophorone	78-59-1	mg/kg						
RA_SO_SVOCs_EPHs	Naphthalene	91-20-3	mg/kg						
RA_SO_SVOCs_EPHs	Nitrobenzene	98-95-3	mg/kg						
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg						
RA_SO_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg						
RA_SO_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg						
RA_SO_SVOCs_EPHs	Pentachlorophenol	87-86-5	mg/kg						
RA_SO_SVOCs_EPHs	Phenanthrene	85-01-8	mg/kg						
RA_SO_SVOCs_EPHs	Phenol	108-95-2	mg/kg						
RA_SO_SVOCs_EPHs	Pyrene	129-00-0	mg/kg						
RA_SO_SVOCs_EPHs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg						
RA_SO_SVOCs_EPHs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg						
RA_SO_SVOCs_EPHs	Total PAHs (b)	Tot-PAH	mg/kg						

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SS-4A	SS-4A	SS-5A	SS-5A	SS-6A	SS-6A
				Sample Type Code	N	N	N	N	N	N
				Sample ID	SS-4A 0-1	SS-4A 1-2	SS-5A 0-1	SS-5A 1-2	SS-6A 0-1	SS-6A 1-2
				Sample Date	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SO_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg							
RA_SO_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	mg/kg							
RA_SO_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg							
RA_SO_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	mg/kg							
RA_SO_VOCs_VPHs	1,1-Dichloroethane	75-34-3	mg/kg							
RA_SO_VOCs_VPHs	1,1-Dichloroethene	75-35-4	mg/kg							
RA_SO_VOCs_VPHs	1,1-Dichloropropene	563-58-6	mg/kg							
RA_SO_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	mg/kg							
RA_SO_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	mg/kg							
RA_SO_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	mg/kg							
RA_SO_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	mg/kg							
RA_SO_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg							
RA_SO_VOCs_VPHs	1,2-Dibromoethane	106-93-4	mg/kg							
RA_SO_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	mg/kg							
RA_SO_VOCs_VPHs	1,2-Dichloroethane	107-06-2	mg/kg							
RA_SO_VOCs_VPHs	1,2-Dichloropropane	78-87-5	mg/kg							
RA_SO_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	mg/kg							
RA_SO_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	mg/kg							
RA_SO_VOCs_VPHs	1,3-Dichloropropane	142-28-9	mg/kg							
RA_SO_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	mg/kg							
RA_SO_VOCs_VPHs	2,2-Dichloropropane	594-20-7	mg/kg							
RA_SO_VOCs_VPHs	2-Butanone (MEK)	78-93-3	mg/kg							
RA_SO_VOCs_VPHs	2-Chlorotoluene	95-49-8	mg/kg							
RA_SO_VOCs_VPHs	2-Hexanone	591-78-6	mg/kg							
RA_SO_VOCs_VPHs	4-Chlorotoluene	106-43-4	mg/kg							
RA_SO_VOCs_VPHs	4-Isopropyltoluene	99-87-6	mg/kg							
RA_SO_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	mg/kg							
RA_SO_VOCs_VPHs	Acetone	67-64-1	mg/kg							
RA_SO_VOCs_VPHs	Benzene	71-43-2	mg/kg							
RA_SO_VOCs_VPHs	Bromobenzene	108-86-1	mg/kg							
RA_SO_VOCs_VPHs	Bromochloromethane	74-97-5	mg/kg							
RA_SO_VOCs_VPHs	Bromodichloromethane	75-27-4	mg/kg							
RA_SO_VOCs_VPHs	Bromoform	75-25-2	mg/kg							
RA_SO_VOCs_VPHs	Bromomethane	74-83-9	mg/kg							
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (ADJUSTED)	C5-C8_ALI_AD	mg/kg							
RA_SO_VOCs_VPHs	C5-C8 ALIPHATICS (UNADJUSTED)	C5-C8_ALI_UN	mg/kg							
RA_SO_VOCs_VPHs	C9-C10 AROMATICS	C9-C10AROM	mg/kg							
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (ADJUSTED)	C9-C12_ADJ	mg/kg							
RA_SO_VOCs_VPHs	C9-C12 ALIPHATICS (UNADJUSTED)	C9-C12ALIPH	mg/kg							
RA_SO_VOCs_VPHs	Carbon Disulfide	75-15-0	mg/kg							
RA_SO_VOCs_VPHs	Carbon Tetrachloride	56-23-5	mg/kg							
RA_SO_VOCs_VPHs	Chlorobenzene	108-90-7	mg/kg							
RA_SO_VOCs_VPHs	Chloroethane	75-00-3	mg/kg							
RA_SO_VOCs_VPHs	Chloroform	67-66-3	mg/kg							
RA_SO_VOCs_VPHs	Chloromethane	74-87-3	mg/kg							
RA_SO_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	mg/kg							
RA_SO_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	mg/kg							
RA_SO_VOCs_VPHs	dibromochloromethane	124-48-1	mg/kg							
RA_SO_VOCs_VPHs	Dibromomethane	74-95-3	mg/kg							
RA_SO_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	mg/kg							
RA_SO_VOCs_VPHs	Ethylbenzene	100-41-4	mg/kg							
RA_SO_VOCs_VPHs	Hexachlorobutadiene	87-68-3	mg/kg							
RA_SO_VOCs_VPHs	Isopropylbenzene	98-82-8	mg/kg							

ATTACHMENT A, TABLE A-1C
SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SS-4A	SS-4A	SS-5A	SS-5A	SS-6A	SS-6A
			Sample Type Code	N	N	N	N	N	N
			Sample ID	SS-4A 0-1	SS-4A 1-2	SS-5A 0-1	SS-5A 1-2	SS-6A 0-1	SS-6A 1-2
			Sample Date	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011
			Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units						
RA_SO_VOCs_VPHs	M,P-Xylenes	179601-23-1	mg/kg						
RA_SO_VOCs_VPHs	Methylene Chloride	75-09-2	mg/kg						
RA_SO_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg						
RA_SO_VOCs_VPHs	Naphthalene	91-20-3	mg/kg						
RA_SO_VOCs_VPHs	n-Butylbenzene	104-51-8	mg/kg						
RA_SO_VOCs_VPHs	n-Propylbenzene	103-65-1	mg/kg						
RA_SO_VOCs_VPHs	O-Xylene	95-47-6	mg/kg						
RA_SO_VOCs_VPHs	sec-Butylbenzene	135-98-8	mg/kg						
RA_SO_VOCs_VPHs	Styrene	100-42-5	mg/kg						
RA_SO_VOCs_VPHs	tert-Butylbenzene	98-06-6	mg/kg						
RA_SO_VOCs_VPHs	Tetrachloroethene	127-18-4	mg/kg						
RA_SO_VOCs_VPHs	Toluene	108-88-3	mg/kg						
RA_SO_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	mg/kg						
RA_SO_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	mg/kg						
RA_SO_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	mg/kg						
RA_SO_VOCs_VPHs	Trichloroethylene	79-01-6	mg/kg						
RA_SO_VOCs_VPHs	Trichlorofluoromethane	75-69-4	mg/kg						
RA_SO_VOCs_VPHs	Vinyl Chloride	75-01-4	mg/kg						

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1D
BACKGROUND SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background
				Location ID	SB-401	SB-401	SB-401	SB-402	SB-402	SB-403	SB-403	SB-404	SB-404	SB-404
				Depth Interval	0 - 1 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	1 - 3 ft
				Sample Type Code	N	FD	N	N	N	N	N	N	N	N
				Sample ID	SB-401-CI20-0-1	SB-401-CI20-0-1-DUP	SB-401-CI20-1-3	SB-402-CI20-0-1	SB-402-CI20-1-3	SB-403-CI20-0-1	SB-403-CI20-1-3	SB-404-CI20-0-1	SB-404-CI20-1-3	SB-404-CI20-1-3
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units											
RA SO Metals	Aluminum	7429-90-5	mg/kg	9370	9930	9140	9700	7370	10300	10400	9140	9710		
RA SO Metals	Antimony	7440-36-0	mg/kg	0.0510 J	0.0500 J	0.051 U	0.0420 J	0.0240 J	0.0610 J	0.0370 J	0.0760 J	0.0500 J		
RA SO Metals	Arsenic	7440-38-2	mg/kg	2.92	2.64	1.97	2.53	2.02	2.93	3.43	2.88	4.03		
RA SO Metals	Barium	7440-39-3	mg/kg	20.9	18.4	23.1	33.4	21.7	18.7	24.2	12.9	38.8		
RA SO Metals	Beryllium	7440-41-7	mg/kg	0.634	0.538	0.540	0.575	0.489	2.11	0.555	0.441	0.621		
RA SO Metals	Cadmium	7440-43-9	mg/kg	0.0390 J	0.0500 J	0.0280 J	0.0430 J	0.0370 J	0.0570 J	0.0500 J	0.0310 J	0.0470 J		
RA SO Metals	Calcium	7440-70-2	mg/kg	477	506	560	683	583	389	591	385	1190		
RA SO Metals	Chromium	7440-47-3	mg/kg	11.8	11.0	10.9	11.7	9.64	10.5	12.3	9.39	15.3		
RA SO Metals	Cobalt	7440-48-4	mg/kg	5.12	3.77	7.37	6.32	6.32	3.21	5.12	3.59	6.79		
RA SO Metals	Copper	7440-50-8	mg/kg	9.08	7.06	11.9	10.7	11.9	6.53	8.86	4.93	12.4		
RA SO Metals	Iron	7439-89-6	mg/kg	13800	14300	16700	15900	13700	17600	15800	10900	19700		
RA SO Metals	Lead	7439-92-1	mg/kg	13.3	15.7	8.76	13.5	8.27	20.4	7.62	6.44	10.4		
RA SO Metals	Magnesium	7439-95-4	mg/kg	2610	2300	3910	3310	3120	1560	2820	1540	3670		
RA SO Metals	Manganese	7439-96-5	mg/kg	156	146	218	196	185	122	154	99.8	217		
RA SO Metals	Mercury	7439-97-6	mg/kg	0.0220 J	0.0350 J	0.0130 J	0.0240 J	0.0170 J	0.0370	0.0330	0.0310 J	0.0190 J		
RA SO Metals	Nickel	7440-02-0	mg/kg	9.03	7.87	10.1	10.7	9.61	8.28	9.34	6.18	12.1		
RA SO Metals	Potassium	7440-09-7	mg/kg	764 J	535 J	1060	1700	1100	514	937	428	1550		
RA SO Metals	Selenium	7782-49-2	mg/kg	0.180 J	0.280 J	0.0730 J	0.160 J	0.0630 J	0.430 J	0.200 J	0.210 J	0.140 J		
RA SO Metals	Silver	7440-22-4	mg/kg	0.0280 J	0.0320 J	0.0110 J	0.0270 J	0.0110 J	0.0620 J	0.0230 J	0.0330 J	0.0220 J		
RA SO Metals	Sodium	7440-23-5	mg/kg	40 U	43 U	41 U	40 U	34 U	45 U	36 U	40 U	42 U		
RA SO Metals	Thallium	7440-28-0	mg/kg	0.129	0.0940 J	0.139	0.181	0.147	0.114	0.127	0.0710 J	0.166		
RA SO Metals	Vanadium	7440-62-2	mg/kg	18.5	17.6	15.1	17.2	13.1	17.4	19.7	14.4	23.5		
RA SO Metals	Zinc	7440-66-6	mg/kg	30.5	28.4	35.0	31.2	26.0	27.2	28.7	18.6	30.0		
RA SO Other	Total Organic Carbon	TOC	mg/kg	18000 J	22000 J	27000 J			29000 J	12000 J				
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.0098 U	0.011 U	0.011 U		
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.0098 U	0.011 U	0.011 U		
RA SO SVOCs EPHs	Acenaphthene	83-32-9	mg/kg	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.0098 U	0.011 U	0.011 U		
RA SO SVOCs EPHs	Acenaphthylene	208-96-8	mg/kg	0.00210 J	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.0098 U	0.011 U	0.011 U		
RA SO SVOCs EPHs	Anthracene	120-12-7	mg/kg	0.00270 J	0.00490 J	0.01 U	0.00180 J	0.01 U	0.011 U	0.0098 U	0.011 U	0.011 U		
RA SO SVOCs EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.0170 J	0.0220	0.01 U	0.0160 J	0.01 U	0.00570 J	0.0098 U	0.00310 J	0.011 U		
RA SO SVOCs EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.0180 J	0.0250 J	0.01 UJ	0.0180 J	0.01 UJ	0.00670 J	0.0098 U	0.011 UJ	0.011 UJ		
RA SO SVOCs EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.0340	0.0400	0.01 U	0.0310	0.01 U	0.0100 J	0.0098 U	0.00560 J	0.011 U		
RA SO SVOCs EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.0160 J	0.0150 J	0.01 U	0.0110 J	0.01 U	0.00440 J	0.0098 U	0.00360 J	0.011 U		
RA SO SVOCs EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.0140 J	0.0170 J	0.01 U	0.0120 J	0.01 U	0.00510 J	0.0098 U	0.011 U	0.011 U		
RA SO SVOCs EPHs	Chrysene	218-01-9	mg/kg	0.0290	0.0330	0.01 U	0.0240	0.01 U	0.00970 J	0.0098 U	0.00580 J	0.011 U		
RA SO SVOCs EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.00320 J	0.00410 J	0.01 U	0.00250 J	0.01 U	0.011 U	0.0098 U	0.011 U	0.011 U		
RA SO SVOCs EPHs	Fluoranthene	206-44-0	mg/kg	0.0520	0.0630	0.01 U	0.0440	0.01 U	0.0170 J	0.0098 U	0.00720 J	0.011 U		
RA SO SVOCs EPHs	Fluorene	86-73-7	mg/kg	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.0098 U	0.011 U	0.011 U		
RA SO SVOCs EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0160 J	0.0130 J	0.01 U	0.0100 J	0.01 U	0.00460 J	0.0098 U	0.00290 J	0.011 U		
RA SO SVOCs EPHs	Naphthalene	91-20-3	mg/kg	0.011 U	0.011 U	0.01 U	0.011 U	0.01 U	0.011 U	0.0098 U	0.011 U	0.011 U		
RA SO SVOCs EPHs	Phenanthrene	85-01-8	mg/kg	0.0290	0.0370	0.01 U	0.0240	0.01 U	0.00840 J	0.0098 U	0.00420 J	0.011 U		
RA SO SVOCs EPHs	Pyrene	129-00-0	mg/kg	0.0310	0.0370	0.01 U	0.0290	0.01 U	0.00950 J	0.0098 U	0.00680 J	0.011 U		
RA SO SVOCs EPHs	Total High MW PAHs (a)	Tot-HMW-PAH	mg/kg	0.23	0.27	0.10 U	0.20	0.10 U	0.080	0.098 U	0.050	0.11 U		
RA SO SVOCs EPHs	Total Low MW PAHs (a)	Tot-LMW-PAH	mg/kg	0.046	0.071	0.080 U	0.037	0.080 U	0.085	0.078 U	0.081	0.088 U		
RA SO SVOCs EPHs	Total PAHs (a)	Tot-PAH	mg/kg	0.28	0.34	0.18 U	0.25	0.18 U	0.14	0.18 U	0.088	0.20 U		

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.

ATTACHMENT A, TABLE A-1D
BACKGROUND SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background
				Location ID	SB-401	SB-401	SB-401	SB-402	SB-402	SB-403	SB-403	SB-404	SB-404
				Depth Interval	0 - 1 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
				Sample Type Code	N	FD	N	N	N	N	N	N	N
				Sample ID	SB-401-CI20-0-1	SB-401-CI20-0-1-DUP	SB-401-CI20-1-3	SB-402-CI20-0-1	SB-402-CI20-1-3	SB-403-CI20-0-1	SB-403-CI20-1-3	SB-404-CI20-0-1	SB-404-CI20-1-3
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units										

PCB = Polychlorinated Biphenyl.
SO = Soil.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1D
BACKGROUND SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background
				Location ID	SB-405	SB-405	SB-406	SB-406	SB-407	SB-407	SB-408	SB-408	SB-409
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
				Sample Type Code	N	N	N	N	N	N	N	N	N
				Sample ID	SB-405-CI20-0-1	SB-405-CI20-1-3	SB-406-CI20-0-1	SB-406-CI20-1-3	SB-407-CI20-0-1	SB-407-CI20-1-3	SB-408-CI20-0-1	SB-408-CI20-1-3	SB-409-CI20-0-1
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units										
RA SO Metals	Aluminum	7429-90-5	mg/kg	7470	10600	9450	10200	9930	13100	8210	10200	10700
RA SO Metals	Antimony	7440-36-0	mg/kg	0.0450 J	0.0160 J	0.140	0.0650 J	0.0500 J	0.0440 J	0.0450 J	0.0410 J	0.0400 J
RA SO Metals	Arsenic	7440-38-2	mg/kg	2.30	2.37	5.97	2.53	2.55	2.56	2.81	2.41	2.53
RA SO Metals	Barium	7440-39-3	mg/kg	11.7	67.3	27.5	21.7	19.8	27.1	14.2	22.2	23.2
RA SO Metals	Beryllium	7440-41-7	mg/kg	0.369	0.553	0.494	0.507	0.484	0.755	0.380	0.539	0.558
RA SO Metals	Cadmium	7440-43-9	mg/kg	0.0513 J	0.0400 J	0.0861 J	0.0580 J	0.0520 J	0.0594 J	0.0510 J	0.0550 J	0.0550 J
RA SO Metals	Calcium	7440-70-2	mg/kg	319	1120	934	469 J	396	426	367	329	359
RA SO Metals	Chromium	7440-47-3	mg/kg	7.36	19.6	10.1	9.92	10.6	9.48	9.01	9.47	9.62
RA SO Metals	Cobalt	7440-48-4	mg/kg	2.85	7.19	2.92	3.18	2.69	2.53	2.78	2.55	2.95
RA SO Metals	Copper	7440-50-8	mg/kg	4.71	5.41	7.78	6.46	5.40	5.50	6.07	5.48	5.52
RA SO Metals	Iron	7439-89-6	mg/kg	9410	15800	12200	12700	12200	12100	12500	12500	13100
RA SO Metals	Lead	7439-92-1	mg/kg	11.2	7.51	20.7	20.2	19.2	16.2	22.2	17.6	15.8
RA SO Metals	Magnesium	7439-95-4	mg/kg	1340	4530	1860	1930 J	1570	1600	1760	1640	1610
RA SO Metals	Manganese	7439-96-5	mg/kg	85.9	199	176	123 J	106	128	97.7	118	118
RA SO Metals	Mercury	7439-97-6	mg/kg	0.0290 J	0.0260 J	0.0200 J	0.018 U	0.0360	0.0300 J	0.0340 J	0.0270 J	0.0240 J
RA SO Metals	Nickel	7440-02-0	mg/kg	5.14	15.2	6.56	6.85	6.22	5.87	6.10	5.82	6.02
RA SO Metals	Potassium	7440-09-7	mg/kg	379	2600	522	596	459	482	442	393	472
RA SO Metals	Selenium	7782-49-2	mg/kg	0.190 J	0.0620 J	0.340 J	0.376 J	0.356 J	0.460	0.300 J	0.356 J	0.389 J
RA SO Metals	Silver	7440-22-4	mg/kg	0.0370 J	0.00910 J	0.0630 J	0.0590 J	0.0540 J	0.0812	0.0370 J	0.0534 J	0.0600 J
RA SO Metals	Sodium	7440-23-5	mg/kg	25 U	33 U	46 U	32 U	34 U	26 U	29 U	30 U	38 U
RA SO Metals	Thallium	7440-28-0	mg/kg	0.0891	0.167	0.144	0.143	0.115	0.146	0.0962	0.111	0.123
RA SO Metals	Vanadium	7440-62-2	mg/kg	11.6	26.7	15.4	16.9	15.5	16.4	14.0	15.1	16.2
RA SO Metals	Zinc	7440-66-6	mg/kg	17.5	28.5	30.9	26.1	21.3	22.4	20.8	21.4	21.9
RA SO Other	Total Organic Carbon	TOC	mg/kg			30000 J	22000 J			23000 J	28000 J	
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg	0.011 U	0.011 U	0.012 U	0.011 U	0.00570 J	0.012 U	0.011 U	0.012 U	0.011 U
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.011 U	0.011 U	0.012 U	0.011 U	0.00410 J	0.012 U	0.011 U	0.012 U	0.011 U
RA SO SVOCs EPHs	Acenaphthene	83-32-9	mg/kg	0.011 U	0.011 U	0.012 U	0.011 U	0.0150 J	0.012 U	0.011 U	0.012 U	0.011 U
RA SO SVOCs EPHs	Acenaphthylene	208-96-8	mg/kg	0.011 U	0.011 U	0.00210 J	0.00190 J	0.00620 J	0.012 U	0.011 U	0.012 U	0.011 U
RA SO SVOCs EPHs	Anthracene	120-12-7	mg/kg	0.011 U	0.011 U	0.00340 J	0.00280 J	0.0210 J	0.00410 J	0.011 U	0.00290 J	0.00410 J
RA SO SVOCs EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.00480 J	0.011 U	0.0320	0.0240 J	0.0720	0.0180 J	0.0230	0.0180 J	0.0210 J
RA SO SVOCs EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.00580 J	0.011 UJ	0.0350 J	0.0290 J	0.0590 J	0.0190 J	0.0270 J	0.0230 J	0.0220 J
RA SO SVOCs EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.00950 J	0.011 U	0.0510	0.0450 J	0.0820	0.0280	0.0480	0.0370	0.0330
RA SO SVOCs EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.00680 J	0.011 U	0.0290	0.0220 J	0.0390	0.0170 J	0.0240	0.0240	0.0170 J
RA SO SVOCs EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.00480 J	0.011 U	0.0220 J	0.0170 J	0.0340	0.0140 J	0.0160 J	0.0120 J	0.0130 J
RA SO SVOCs EPHs	Chrysene	218-01-9	mg/kg	0.00950 J	0.011 U	0.0480	0.0380 J	0.0940	0.0280	0.0420	0.0320	0.0300
RA SO SVOCs EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.011 U	0.011 U	0.00670 J	0.00720 J	0.0130 J	0.00410 J	0.00680 J	0.00560 J	0.00500 J
RA SO SVOCs EPHs	Fluoranthene	206-44-0	mg/kg	0.0140 J	0.011 U	0.0690	0.0570 J	0.16	0.0440	0.0620	0.0510	0.0480
RA SO SVOCs EPHs	Fluorene	86-73-7	mg/kg	0.011 U	0.011 U	0.012 U	0.011 U	0.0280	0.012 U	0.011 U	0.012 U	0.011 U
RA SO SVOCs EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.00460 J	0.011 U	0.0210 J	0.0170 J	0.0320	0.0120 J	0.0200 J	0.0190 J	0.0150 J
RA SO SVOCs EPHs	Naphthalene	91-20-3	mg/kg	0.011 U	0.011 U	0.012 U	0.011 U	0.00350 J	0.012 U	0.011 U	0.012 U	0.011 U
RA SO SVOCs EPHs	Phenanthrene	85-01-8	mg/kg	0.00750 J	0.011 U	0.0270	0.0360 J	0.21	0.0310	0.0420	0.0310	0.0310
RA SO SVOCs EPHs	Pyrene	129-00-0	mg/kg	0.0110 J	0.011 U	0.0680	0.0570 J	0.18	0.0430	0.0610	0.0380	0.0390
RA SO SVOCs EPHs	Total High MW PAHs (a)	Tot-HMW-PAH	mg/kg	0.077	0.11 U	0.38	0.31	0.77	0.23	0.33	0.26	0.24
RA SO SVOCs EPHs	Total Low MW PAHs (a)	Tot-LMW-PAH	mg/kg	0.085	0.088 U	0.046	0.053	0.29	0.060	0.12	0.051	0.060
RA SO SVOCs EPHs	Total PAHs (a)	Tot-PAH	mg/kg	0.13	0.20 U	0.43	0.37	1.1	0.29	0.42	0.32	0.31

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.

ATTACHMENT A, TABLE A-1D
BACKGROUND SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background
				Location ID	SB-405	SB-405	SB-406	SB-406	SB-407	SB-407	SB-408	SB-408	SB-409
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft
				Sample Type Code	N	N	N	N	N	N	N	N	N
				Sample ID	SB-405-CI20-0-1	SB-405-CI20-1-3	SB-406-CI20-0-1	SB-406-CI20-1-3	SB-407-CI20-0-1	SB-407-CI20-1-3	SB-408-CI20-0-1	SB-408-CI20-1-3	SB-409-CI20-0-1
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units										

PCB = Polychlorinated Biphenyl.
SO = Soil.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1D
BACKGROUND SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background
				Location ID	SB-409	SB-410	SB-410	SB-411	SB-411	SB-412	SB-412	SB-413	SB-413	SB-413
				Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	
				Sample Type Code	N	N	N	N	N	N	N	N	N	
				Sample ID	SB-409-CI20-1-3	SB-410-CI20-0-1	SB-410-CI20-1-3	SB-411-CI20-0-1	SB-411-CI20-1-3	SB-412-CI20-0-1	SB-412-CI20-1-3	SB-413-CI20-0-1	SB-413-CI20-1-3	
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	
Method Analyte Group	Compound	CAS #	Units											
RA SO Metals	Aluminum	7429-90-5	mg/kg	11400	7720	12200	7320	7220	8180	10500	8840	8160		
RA SO Metals	Antimony	7440-36-0	mg/kg	0.0490 J	0.0580 J	0.0550 J	0.0530 J	0.0480 J	0.0500 J	0.0480 J	0.0640 J	0.0410 J		
RA SO Metals	Arsenic	7440-38-2	mg/kg	2.49	2.34 J	2.88	3.56	2.21	2.06	2.06	2.58	2.28		
RA SO Metals	Barium	7440-39-3	mg/kg	27.4	24.6	28.4	30.7	24.6	20.0	20.3	23.0	19.4		
RA SO Metals	Beryllium	7440-41-7	mg/kg	0.655	0.413	0.628	0.419	0.460	0.437	0.520	0.419	0.468		
RA SO Metals	Cadmium	7440-43-9	mg/kg	0.0720 J	0.0658 J	0.0753 J	0.101	0.0752	0.0726	0.0460 J	0.0697 J	0.0420 J		
RA SO Metals	Calcium	7440-70-2	mg/kg	418	1000	372	1290	1560	724	546	702	946		
RA SO Metals	Chromium	7440-47-3	mg/kg	9.58	8.14	10.2	8.09	8.86	9.54	12.4	10.2	10.8		
RA SO Metals	Cobalt	7440-48-4	mg/kg	2.68	2.66	3.10	3.66	3.94	3.35	3.40	3.22	4.56		
RA SO Metals	Copper	7440-50-8	mg/kg	5.92	8.12	6.32	14.2	13.7	9.79	7.36	9.31	9.28		
RA SO Metals	Iron	7439-89-6	mg/kg	13100	10900	13500	11600	10400	10700	14400	12900	13100		
RA SO Metals	Lead	7439-92-1	mg/kg	17.7	20.4 J	20.0	22.5	37.8	34.2	54.0	22.6	17.3		
RA SO Metals	Magnesium	7439-95-4	mg/kg	1600	1600	1700	2020	1860	1920	2110	2040	2650		
RA SO Metals	Manganese	7439-96-5	mg/kg	113	118 J	125	137	114	135	135	111	152		
RA SO Metals	Mercury	7439-97-6	mg/kg	0.0280 J	0.0300 J	0.0280 J	0.0270 J	0.0420	0.0290 J	0.0180 J	0.0542	0.0100 J		
RA SO Metals	Nickel	7440-02-0	mg/kg	6.08	5.44	6.55	6.68	6.06	6.19	6.92	6.66	8.52		
RA SO Metals	Potassium	7440-09-7	mg/kg	460	590 J	479	686	862	574	544	636	977		
RA SO Metals	Selenium	7782-49-2	mg/kg	0.405 J	0.265 J	0.417 J	0.200 J	0.240 J	0.230 J	0.280 J	0.279 J	0.190 J		
RA SO Metals	Silver	7440-22-4	mg/kg	0.0649 J	0.0750	0.0816 J	0.135	0.0966	0.0882	0.0517 J	0.0865	0.0310 J		
RA SO Metals	Sodium	7440-23-5	mg/kg	38 U	26 U	36 U	104	27 U	24 U	30 U	28 U	38 U		
RA SO Metals	Thallium	7440-28-0	mg/kg	0.143	0.107	0.149	0.0927	0.108	0.0929	0.106	0.102	0.140		
RA SO Metals	Vanadium	7440-62-2	mg/kg	16.5	12.5	18.2	14.6	12.2	11.9	15.7	15.1	14.5		
RA SO Metals	Zinc	7440-66-6	mg/kg	24.6	30.0 J	25.4	34.2	34.5	34.6	26.6	27.5	26.2		
RA SO Other	Total Organic Carbon	TOC	mg/kg		25000 J	31000 J	26000 J	16000 J			25000 J	13000 J		
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg	0.012 U	0.012 U	0.00260 J	0.00460 J	0.00980 J	0.00890 J	0.0130 J	0.00380 J	0.00350 J		
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.012 U	0.012 U	0.012 U	0.00470 J	0.0100 J	0.0110 J	0.0150 J	0.00390 J	0.00370 J		
RA SO SVOCs EPHs	Acenaphthene	83-32-9	mg/kg	0.012 U	0.012 U	0.00320 J	0.00280 J	0.0160 J	0.0250	0.0130 J	0.00250 J	0.00510 J		
RA SO SVOCs EPHs	Acenaphthylene	208-96-8	mg/kg	0.012 U	0.012 U	0.00310 J	0.00280 J	0.00600 J	0.0160 J	0.00520 J	0.00580 J	0.00750 J		
RA SO SVOCs EPHs	Anthracene	120-12-7	mg/kg	0.00400 J	0.00270 J	0.00850 J	0.00920 J	0.11	0.0370	0.0190 J	0.00990 J	0.0140 J		
RA SO SVOCs EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.0240	0.0150 J	0.0430	0.0830	0.84	0.26	0.1	0.0710	0.16		
RA SO SVOCs EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.0290 J	0.0140 J	0.0390	0.0840	0.8	0.28	0.11	0.0740	0.17		
RA SO SVOCs EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.0440	0.0220 J	0.0590	0.13	1.2	0.42	0.17	0.11	0.25		
RA SO SVOCs EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.0230 J	0.0110 J	0.0250	0.0490	0.45	0.19	0.0820	0.0520	0.13		
RA SO SVOCs EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.0170 J	0.00850 J	0.0200 J	0.0370	0.43	0.13	0.0480	0.0410	0.0930		
RA SO SVOCs EPHs	Chrysene	218-01-9	mg/kg	0.0360	0.0210 J	0.0530	0.0880	0.9	0.31	0.13	0.0920	0.19		
RA SO SVOCs EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.00620 J	0.00330 J	0.00870 J	0.0170 J	0.16	0.0640	0.0250	0.0170 J	0.0400		
RA SO SVOCs EPHs	Fluoranthene	206-44-0	mg/kg	0.0600	0.0360 J	0.0890	0.13	1.2	0.38	0.17	0.15	0.22		
RA SO SVOCs EPHs	Fluorene	86-73-7	mg/kg	0.012 U	0.012 U	0.00560 J	0.01 U	0.0240	0.0270	0.0150 J	0.00710 J	0.00810 J		
RA SO SVOCs EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0190 J	0.00930 J	0.0200 J	0.0400	0.43	0.16	0.0660	0.0430	0.11		
RA SO SVOCs EPHs	Naphthalene	91-20-3	mg/kg	0.012 U	0.012 U	0.012 U	0.00810 J	0.0140 J	0.0370	0.0130 J	0.00680 J	0.00730 J		
RA SO SVOCs EPHs	Phenanthrene	85-01-8	mg/kg	0.0350	0.0200 J	0.0670	0.0520	0.51	0.29	0.14	0.12	0.14		
RA SO SVOCs EPHs	Pyrene	129-00-0	mg/kg	0.0440	0.0260 J	0.0750	0.12	1.2	0.67	0.22	0.15	0.34		
RA SO SVOCs EPHs	Total High MW PAHs (a)	Tot-HMW-PAH	mg/kg	0.30	0.17	0.43	0.78	7.6	2.9	1.1	0.80	1.7		
RA SO SVOCs EPHs	Total Low MW PAHs (a)	Tot-LMW-PAH	mg/kg	0.063	0.039	0.099	0.090	0.70	0.45	0.23	0.16	0.19		
RA SO SVOCs EPHs	Total PAHs (a)	Tot-PAH	mg/kg	0.37	0.23	0.53	0.87	8.3	3.3	1.4	0.96	1.9		

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.

ATTACHMENT A, TABLE A-1D
BACKGROUND SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background
			Location ID	SB-409	SB-410	SB-410	SB-411	SB-411	SB-412	SB-412	SB-413	SB-413
			Depth Interval	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
			Sample Type Code	N	N	N	N	N	N	N	N	N
			Sample ID	SB-409-CI20-1-3	SB-410-CI20-0-1	SB-410-CI20-1-3	SB-411-CI20-0-1	SB-411-CI20-1-3	SB-412-CI20-0-1	SB-412-CI20-1-3	SB-413-CI20-0-1	SB-413-CI20-1-3
			Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units									

PCB = Polychlorinated Biphenyl.
SO = Soil.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1D
BACKGROUND SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background
				Location ID	SB-414	SB-414	SB-415	SB-415	SB-416	SB-416	SB-416	SB-417	SB-417
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
				Sample Type Code	N	N	N	N	N	N	FD	N	N
				Sample ID	SB-414-CI20-0-1	SB-414-CI20-1-3	SB-415-CI20-0-1	SB-415-CI20-1-3	SB-416-CI20-0-1	SB-416-CI20-1-3	SB-416-CI20-1-3-DUP	SB-417-CI20-0-1	SB-417-CI20-1-3
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units										
RA SO Metals	Aluminum	7429-90-5	mg/kg	6570	6730	6980	6830	9340	10800	15700	5050	9210
RA SO Metals	Antimony	7440-36-0	mg/kg	0.0530 J	0.0480 J	0.0620 J	0.0490 J	0.0650 J	0.0350 J	0.0350 J	0.037 U	0.0220 J
RA SO Metals	Arsenic	7440-38-2	mg/kg	2.59	2.33	2.71	2.05	2.53	2.07	2.45	1.12	1.63
RA SO Metals	Barium	7440-39-3	mg/kg	41.4	17.5	37.4	21.7	23.0	17.6 J	31.5 J	12.4	17.5
RA SO Metals	Beryllium	7440-41-7	mg/kg	0.372	0.472	0.431	0.459	0.466	0.569	0.799	0.670	0.396
RA SO Metals	Cadmium	7440-43-9	mg/kg	0.142	0.0450 J	0.118	0.0812 J	0.0715 J	0.0410 J	0.0621 J	0.0450 J	0.0250 J
RA SO Metals	Calcium	7440-70-2	mg/kg	1600	774	1940	1290	722	330	502	391	399
RA SO Metals	Chromium	7440-47-3	mg/kg	9.00	10.1	10.1	6.34	9.90	8.34	11.1	3.90	11.9
RA SO Metals	Cobalt	7440-48-4	mg/kg	4.20	4.38	4.82	2.34	3.56	2.62	2.61	2.09	3.73
RA SO Metals	Copper	7440-50-8	mg/kg	14.0	12.0	17.3	8.56	9.44	5.35	4.35	3.50	7.97
RA SO Metals	Iron	7439-89-6	mg/kg	11900	13200	12600	8830	11700	9800	12800	7580	13200
RA SO Metals	Lead	7439-92-1	mg/kg	24.3	38.3	25.9	20.6	22.1	9.20	9.74	7.52	5.79
RA SO Metals	Magnesium	7439-95-4	mg/kg	2630	2280	3030	1190	2350	1710	1610	1140	2970
RA SO Metals	Manganese	7439-96-5	mg/kg	181	132	207	99.4	162	116	99.8	143	146
RA SO Metals	Mercury	7439-97-6	mg/kg	0.0500	0.00910 J	0.0340	0.0370 J	0.0330 J	0.0210 J	0.0270 J	0.00720 J	0.0310 J
RA SO Metals	Nickel	7440-02-0	mg/kg	7.93	6.91	8.67	4.29	7.38	5.54	5.96	3.25	8.81
RA SO Metals	Potassium	7440-09-7	mg/kg	1010	811	1500	692	845	545	508	781	743
RA SO Metals	Selenium	7782-49-2	mg/kg	0.140 J	0.130 J	0.140 J	0.250 J	0.314 J	0.260 J	0.445	0.120 J	0.140 J
RA SO Metals	Silver	7440-22-4	mg/kg	0.136	0.0240 J	0.194	0.0966	0.0854	0.0682 J	0.0777	0.0170 J	0.110
RA SO Metals	Sodium	7440-23-5	mg/kg	35 U	33 U	36 U	37 U	29 U	34 U	29 U	30 U	87.9
RA SO Metals	Thallium	7440-28-0	mg/kg	0.0920	0.124	0.0994	0.0971	0.118	0.138	0.164	0.0872	0.121
RA SO Metals	Vanadium	7440-62-2	mg/kg	12.7	12.3	12.5	10.6	14.7	13.0	19.0	6.24	14.9
RA SO Metals	Zinc	7440-66-6	mg/kg	51.4	31.8	45.0	33.6	29.8	19.9	22.5	27.0	29.8
RA SO Other	Total Organic Carbon	TOC	mg/kg					34000 J	16000 J	32000 J		
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg	0.00320 J	0.00520 J	0.00350 J	0.00300 J	0.011 U	0.011 U	0.011 U	0.011 U	0.0099 U
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.00350 J	0.00400 J	0.00360 J	0.00280 J	0.011 U	0.011 U	0.011 U	0.011 U	0.0099 U
RA SO SVOCs EPHs	Acenaphthene	83-32-9	mg/kg	0.00220 J	0.00580 J	0.00200 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.0099 U
RA SO SVOCs EPHs	Acenaphthylene	208-96-8	mg/kg	0.00460 J	0.0190	0.00470 J	0.00260 J	0.00300 J	0.011 U	0.011 U	0.011 U	0.0099 U
RA SO SVOCs EPHs	Anthracene	120-12-7	mg/kg	0.0120 J	0.0300	0.00970 J	0.00420 J	0.00360 J	0.011 U	0.00250 J	0.011 U	0.0099 U
RA SO SVOCs EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.0910	0.2	0.0950	0.0430	0.0440	0.00950 J	0.0200 J	0.00580 J	0.0099 U
RA SO SVOCs EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.0940	0.19	0.0990	0.0470	0.0450	0.0120 J	0.0270	0.00640 J	0.0099 U
RA SO SVOCs EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.13	0.27	0.14	0.0720	0.0700	0.0220	0.0450	0.0130 J	0.0099 U
RA SO SVOCs EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.0700	0.12	0.0670	0.0360	0.0350	0.0120 J	0.0210 J	0.00660 J	0.0099 U
RA SO SVOCs EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.0410	0.11	0.0480	0.0250	0.0250	0.00890 J	0.0170 J	0.00430 J	0.0099 U
RA SO SVOCs EPHs	Chrysene	218-01-9	mg/kg	0.0930	0.22	0.0990	0.0550	0.0540	0.0150 J	0.0350	0.00950 J	0.0099 U
RA SO SVOCs EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.0210	0.0390	0.0220	0.0120 J	0.0100 J	0.00240 J	0.00680 J	0.011 U	0.0099 U
RA SO SVOCs EPHs	Fluoranthene	206-44-0	mg/kg	0.13	0.33	0.14	0.0720	0.0800	0.0230	0.0520	0.0140 J	0.0099 U
RA SO SVOCs EPHs	Fluorene	86-73-7	mg/kg	0.00420 J	0.0280	0.00340 J	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.0099 U
RA SO SVOCs EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0620	0.0960	0.0560	0.0320	0.0280	0.00920 J	0.0160 J	0.00480 J	0.0099 U
RA SO SVOCs EPHs	Naphthalene	91-20-3	mg/kg	0.00620 J	0.00660 J	0.00510 J	0.00350 J	0.011 U	0.011 U	0.011 U	0.011 U	0.0099 U
RA SO SVOCs EPHs	Phenanthrene	85-01-8	mg/kg	0.0830	0.28	0.0670	0.0350	0.0390	0.00970 J	0.0290	0.00770 J	0.0099 U
RA SO SVOCs EPHs	Pyrene	129-00-0	mg/kg	0.17	0.42	0.18	0.0730	0.0820	0.0190 J	0.0490	0.0120 J	0.0099 U
RA SO SVOCs EPHs	Total High MW PAHs (a)	Tot-HMW-PAH	mg/kg	0.90	2.0	0.95	0.47	0.47	0.13	0.29	0.083	0.099 U
RA SO SVOCs EPHs	Total Low MW PAHs (a)	Tot-LMW-PAH	mg/kg	0.12	0.38	0.099	0.058	0.062	0.087	0.046	0.085	0.079 U
RA SO SVOCs EPHs	Total PAHs (a)	Tot-PAH	mg/kg	1.0	2.4	1.0	0.52	0.55	0.20	0.35	0.14	0.18 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.

ATTACHMENT A, TABLE A-1D
BACKGROUND SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background
				Location ID	SB-414	SB-414	SB-415	SB-415	SB-416	SB-416	SB-416	SB-417	SB-417
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
				Sample Type Code	N	N	N	N	N	N	FD	N	N
				Sample ID	SB-414-CI20-0-1	SB-414-CI20-1-3	SB-415-CI20-0-1	SB-415-CI20-1-3	SB-416-CI20-0-1	SB-416-CI20-1-3	SB-416-CI20-1-3-DUP	SB-417-CI20-0-1	SB-417-CI20-1-3
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units										

PCB = Polychlorinated Biphenyl.
SO = Soil.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-1D
BACKGROUND SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background
				Location ID	SB-418	SB-418	SB-419	SB-419	SB-420	SB-420
				Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
				Sample Type Code	N	N	N	N	N	N
				Sample ID	SB-418-CI20-0-1	SB-418-CI20-1-3	SB-419-CI20-0-1	SB-419-CI20-1-3	SB-420-CI20-0-1	SB-420-CI20-1-3
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units							
RA SO Metals	Aluminum	7429-90-5	mg/kg	4480	10900	3540	8710	13800	12700
RA SO Metals	Antimony	7440-36-0	mg/kg	0.0190 J	0.0390 J	0.0190 J	0.0350 J	0.0490 J	0.0380 J
RA SO Metals	Arsenic	7440-38-2	mg/kg	1.10	2.68	0.860	2.39	3.40	2.66
RA SO Metals	Barium	7440-39-3	mg/kg	10.0	19.7	8.88	12.7	21.3	15.7
RA SO Metals	Beryllium	7440-41-7	mg/kg	0.719	0.654	0.575	0.624	0.969	0.592
RA SO Metals	Cadmium	7440-43-9	mg/kg	0.0420 J	0.0330 J	0.0390 J	0.0200 J	0.0640 J	0.0450 J
RA SO Metals	Calcium	7440-70-2	mg/kg	531	382	367	248	456	416
RA SO Metals	Chromium	7440-47-3	mg/kg	2.94	12.4	2.62	10.0	11.8	12.0
RA SO Metals	Cobalt	7440-48-4	mg/kg	1.88	4.97	1.63	3.07	2.91	2.59
RA SO Metals	Copper	7440-50-8	mg/kg	4.76	10.2	3.39	7.18	7.13	5.77
RA SO Metals	Iron	7439-89-6	mg/kg	8380	17800	6020	13000	14300	13300
RA SO Metals	Lead	7439-92-1	mg/kg	6.77	8.49	12.1	8.73	11.2	8.10
RA SO Metals	Magnesium	7439-95-4	mg/kg	1050	3230	714	2110	1810	1650
RA SO Metals	Manganese	7439-96-5	mg/kg	136	205	95.8	123	92.0	74.8
RA SO Metals	Mercury	7439-97-6	mg/kg	0.017 U	0.018 U	0.014 U	0.017 U	0.018 U	0.016 U
RA SO Metals	Nickel	7440-02-0	mg/kg	3.60	9.04	2.15	7.12	6.33	6.53
RA SO Metals	Potassium	7440-09-7	mg/kg	775	1060	560	691	580	529
RA SO Metals	Selenium	7782-49-2	mg/kg	0.0590 J	0.180 J	0.0620 J	0.120 J	0.440 J	0.345 J
RA SO Metals	Silver	7440-22-4	mg/kg	0.0170 J	0.0190 J	0.0140 J	0.0220 J	0.110 J	0.0410 J
RA SO Metals	Sodium	7440-23-5	mg/kg	37 U	34 U	30 U	27 U	37 U	35 U
RA SO Metals	Thallium	7440-28-0	mg/kg	0.0968	0.146	0.0570 J	0.108	0.165	0.119
RA SO Metals	Vanadium	7440-62-2	mg/kg	4.80	18.0	3.99	12.9	19.6	20.8
RA SO Metals	Zinc	7440-66-6	mg/kg	39.7	28.2	26.2	19.0	31.5	23.0
RA SO Other	Total Organic Carbon	TOC	mg/kg	9900 J	21000 J			22000 J	16000 J
RA SO SVOCs EPHs	1-Methylnaphthalene	90-12-0	mg/kg	0.011 U	0.01 U	0.0097 U	0.01 U	0.01 U	0.011 U
RA SO SVOCs EPHs	2-Methylnaphthalene	91-57-6	mg/kg	0.011 U	0.01 U	0.0097 U	0.01 U	0.01 U	0.011 U
RA SO SVOCs EPHs	Acenaphthene	83-32-9	mg/kg	0.011 U	0.01 U	0.0097 U	0.01 U	0.01 U	0.011 U
RA SO SVOCs EPHs	Acenaphthylene	208-96-8	mg/kg	0.011 U	0.01 U	0.0097 U	0.01 U	0.01 U	0.011 U
RA SO SVOCs EPHs	Anthracene	120-12-7	mg/kg	0.011 U	0.01 U	0.0097 U	0.01 U	0.01 U	0.011 U
RA SO SVOCs EPHs	Benzo(a)anthracene	56-55-3	mg/kg	0.00810 J	0.01 U	0.00910 J	0.01 U	0.00380 J	0.011 U
RA SO SVOCs EPHs	Benzo(a)Pyrene	50-32-8	mg/kg	0.0100 J	0.01 U	0.0110 J	0.01 UJ	0.00450 J	0.011 UJ
RA SO SVOCs EPHs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.0160 J	0.01 U	0.0180 J	0.01 U	0.00740 J	0.011 U
RA SO SVOCs EPHs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.00820 J	0.01 U	0.0110 J	0.01 U	0.00410 J	0.011 U
RA SO SVOCs EPHs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.00750 J	0.01 U	0.00800 J	0.01 U	0.00360 J	0.011 U
RA SO SVOCs EPHs	Chrysene	218-01-9	mg/kg	0.0130 J	0.01 U	0.0097 U	0.01 U	0.01 U	0.011 U
RA SO SVOCs EPHs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.00260 J	0.01 U	0.00200 J	0.01 U	0.01 U	0.011 U
RA SO SVOCs EPHs	Fluoranthene	206-44-0	mg/kg	0.0210	0.01 U	0.0210	0.01 U	0.00760 J	0.011 U
RA SO SVOCs EPHs	Fluorene	86-73-7	mg/kg	0.011 U	0.01 U	0.0097 U	0.01 U	0.01 U	0.011 U
RA SO SVOCs EPHs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.00650 J	0.01 U	0.00820 J	0.01 U	0.00370 J	0.011 U
RA SO SVOCs EPHs	Naphthalene	91-20-3	mg/kg	0.011 U	0.01 U	0.0097 U	0.01 U	0.01 U	0.011 U
RA SO SVOCs EPHs	Phenanthrene	85-01-8	mg/kg	0.0110 J	0.01 U	0.00870 J	0.01 U	0.00430 J	0.011 U
RA SO SVOCs EPHs	Pyrene	129-00-0	mg/kg	0.0180 J	0.01 U	0.0190	0.01 U	0.00730 J	0.011 U
RA SO SVOCs EPHs	Total High MW PAHs (a)	Tot-HMW-PAH	mg/kg	0.11	0.10 U	0.11	0.10 U	0.053	0.11 U
RA SO SVOCs EPHs	Total Low MW PAHs (a)	Tot-LMW-PAH	mg/kg	0.088	0.080 U	0.077	0.080 U	0.074	0.088 U
RA SO SVOCs EPHs	Total PAHs (a)	Tot-PAH	mg/kg	0.17	0.18 U	0.17	0.18 U	0.092	0.20 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.

ATTACHMENT A, TABLE A-1D
BACKGROUND SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background	SO-Background
			Location ID	SB-418	SB-418	SB-419	SB-419	SB-420	SB-420
			Depth Interval	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft
			Sample Type Code	N	N	N	N	N	N
			Sample ID	SB-418-CI20-0-1	SB-418-CI20-1-3	SB-419-CI20-0-1	SB-419-CI20-1-3	SB-420-CI20-0-1	SB-420-CI20-1-3
			Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units						

PCB = Polychlorinated Biphenyl.
SO = Soil.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-2A
HYDRIC SOIL SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
HS	Background	SSH-311	5/22/2020	SSH-311-CI20-0-1	N		0 - 1 ft
HS	Background	SSH-311	5/22/2020	SSH-311-CI20-0-1-DUP	FD	SSH-311-CI20-0-1	0 - 1 ft
HS	Background	SSH-311	5/22/2020	SSH-311-CI20-1-2	N		1 - 2 ft
HS	Background	SSH-312	5/22/2020	SSH-312-CI20-0-1	N		0 - 1 ft
HS	Background	SSH-312	5/22/2020	SSH-312-CI20-1-2	N		1 - 2 ft
HS	Background	SSH-313	5/22/2020	SSH-313-CI20-0-1	N		0 - 1 ft
HS	Background	SSH-313	5/22/2020	SSH-313-CI20-1-2	N		1 - 2 ft
HS	Background	SSH-314	5/22/2020	SSH-314-CI20-0-1	N		0 - 1 ft
HS	Background	SSH-314	5/22/2020	SSH-314-CI20-1-2	N		1 - 2 ft
HS	Background	SSH-315	5/22/2020	SSH-315-CI20-0-1	N		0 - 1 ft
HS	Background	SSH-315	5/22/2020	SSH-315-CI20-1-2	N		1 - 2 ft
HS	Background	SSH-316	5/22/2020	SSH-316-CI20-0-1	N		0 - 1 ft
HS	Background	SSH-316	5/22/2020	SSH-316-CI20-1-2	N		1 - 2 ft
HS	Background	SSH-317	5/22/2020	SSH-317-CI20-0-1	N		0 - 1 ft
HS	Background	SSH-317	5/22/2020	SSH-317-CI20-1-2	N		1 - 2 ft
HS	Background	SSH-318	5/22/2020	SSH-318-CI20-0-1	N		0 - 1 ft
HS	Background	SSH-318	5/22/2020	SSH-318-CI20-1-2	N		1 - 2 ft
HS	Background	SSH-319	5/22/2020	SSH-319-CI20-0-1	N		0 - 1 ft
HS	Background	SSH-319	5/22/2020	SSH-319-CI20-1-2	N		1 - 2 ft
HS	Background	SSH-320	5/22/2020	SSH-320-CI20-0-1	N		0 - 1 ft
HS	Background	SSH-320	5/22/2020	SSH-320-CI20-1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-1	11/30/2011	SSH-1A 0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-1	11/30/2011	SSH-1A 1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-1	11/30/2011	SSH-1A 0-1DUP	FD	SSH-1A 0-1	0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-2	11/29/2011	SSH-2A 0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-2	11/29/2011	SSH-2A 1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-3	11/29/2011	SSH-3A 0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-3	11/29/2011	SSH-3A 1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-3	11/29/2011	SSH-3A-D 0-1	FD	SSH-3A 0-1	0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-301	10/4/2019	SSH-301-CI19-0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-301	10/4/2019	SSH-301-CI19-0-1-DUP	FD	SSH-301-CI19-0-1	0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-301	10/4/2019	SSH-301-CI19-1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-302	10/4/2019	SSH-302-CI19-0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-302	10/4/2019	SSH-302-CI19-1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-302	10/4/2019	SSH-302-CI19-1-2-DUP	FD	SSH-302-CI19-1-2	1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-303	10/4/2019	SSH-303-CI19-0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-303	10/4/2019	SSH-303-CI19-1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-304	10/4/2019	SSH-304-CI19-0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-304	10/4/2019	SSH-304-CI19-1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-305	10/4/2019	SSH-305-CI19-0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-305	10/4/2019	SSH-305-CI19-1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-306	10/4/2019	SSH-306-CI19-0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-306	10/4/2019	SSH-306-CI19-1-2	N		1 - 2 ft

ATTACHMENT A, TABLE A-2A
HYDRIC SOIL SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-307	10/4/2019	SSH-307-CI19-0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-307	10/4/2019	SSH-307-CI19-1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-308	10/4/2019	SSH-308-CI19-0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-308	10/4/2019	SSH-308-CI19-1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-309	10/4/2019	SSH-309-CI19-0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-309	10/4/2019	SSH-309-CI19-1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-310	10/4/2019	SSH-310-CI19-0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-310	10/4/2019	SSH-310-CI19-1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-4	11/29/2011	SSH-4A 0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-4	11/29/2011	SSH-4A 1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-5	11/29/2011	SSH-5A 0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-5	11/29/2011	SSH-5A 1-2	N		1 - 2 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-6	11/29/2011	SSH-6A 0-1	N		0 - 1 ft
HS	Off-Project Red Maple Swamp /Tidal Marsh	SSH-6	11/29/2011	SSH-6A 1-2	N		1 - 2 ft

Notes:
FD - Field duplicate.
ft - Feet.
N - Normal sample.
HS - Hydric Soil.

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-1	SSH-1	SSH-1	SSH-2	SSH-2	SSH-3	SSH-3
				Sample Type Code	N	N	FD	N	N	N	N
				Sample ID	SSH-1A 0-1	SSH-1A 1-2	SSH-1A 0-1DUP	SSH-2A 0-1	SSH-2A 1-2	SSH-3A 0-1	SSH-3A 1-2
				Sample Date	11/30/2011	11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_Metals	Aluminum	7429-90-5	mg/kg								
RA_HS_Metals	Antimony	7440-36-0	mg/kg								
RA_HS_Metals	Arsenic	7440-38-2	mg/kg	5.9	6.1	5.72	4.4 J	5.2 J	4.3 J	3.8 J	
RA_HS_Metals	Barium	7440-39-3	mg/kg	5.2	6.6	5.1	8.3	9.9	8.5 J	7.7 J	
RA_HS_Metals	Beryllium	7440-41-7	mg/kg								
RA_HS_Metals	Cadmium	7440-43-9	mg/kg	0.3 J	0.2 J	0.21 J	1.4 U	1.3 U	0.6 J	1.8 U	
RA_HS_Metals	Calcium	7440-70-2	mg/kg								
RA_HS_Metals	Chromium	7440-47-3	mg/kg	8.4	8.6	8.11	16.3	16.8	16.6	11.3	
RA_HS_Metals	Cobalt	7440-48-4	mg/kg								
RA_HS_Metals	Copper	7440-50-8	mg/kg								
RA_HS_Metals	Iron	7439-89-6	mg/kg								
RA_HS_Metals	Lead	7439-92-1	mg/kg	37.5	17.1	40.5	41.8	31.5	74.8	22	
RA_HS_Metals	Magnesium	7439-95-4	mg/kg								
RA_HS_Metals	Manganese	7439-96-5	mg/kg								
RA_HS_Metals	Mercury	7439-97-6	mg/kg	0.042 U	0.041 U		0.083 U	0.069 J	0.058 J	0.098 U	
RA_HS_Metals	Nickel	7440-02-0	mg/kg								
RA_HS_Metals	Potassium	7440-09-7	mg/kg								
RA_HS_Metals	Selenium	7782-49-2	mg/kg	7.1 U	9.1 U	7.1 U	2.3 J	13.2 U	2.2 J	18.4 U	
RA_HS_Metals	Silver	7440-22-4	mg/kg	0.7 U	0.9 U	0.7 U	1.4 U	1.3 U	1.8 U	1.8 U	
RA_HS_Metals	Sodium	7440-23-5	mg/kg								
RA_HS_Metals	Thallium	7440-28-0	mg/kg								
RA_HS_Metals	Vanadium	7440-62-2	mg/kg								
RA_HS_Metals	Zinc	7440-66-6	mg/kg								
RA_HS_Other	Total Organic Carbon	TOC	mg/kg	46700	51400		133000	117000	182000	206000	
RA_HS_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.125 U	0.145 U		0.172 U	0.2 U	0.192 U	0.245 U	
RA_HS_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.125 U	0.145 U		0.172 U	0.2 U	0.192 U	0.245 U	
RA_HS_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.125 U	0.145 U		0.172 U	0.2 U	0.192 U	0.245 U	
RA_HS_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.125 U	0.145 U		0.172 U	0.2 U	0.192 U	0.245 U	
RA_HS_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.125 U	0.145 U		0.172 U	0.2 U	0.192 U	0.245 U	
RA_HS_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.125 U	0.145 U		0.172 U	0.2 U	0.192 U	0.245 U	
RA_HS_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.0647 J	0.145 U		0.0613 J	0.2 U	0.118 J	0.245 U	
RA_HS_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg	0.125 U	0.145 U		0.172 U	0.2 U	0.192 U	0.245 U	
RA_HS_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg	0.125 U	0.145 U		0.172 U	0.2 U	0.192 U	0.245 U	
RA_HS_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg								
RA_HS_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	1.1	1.3 U		1.4	1.8 U	1.7	2.2 U	
RA_HS_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA_HS_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA_HS_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA_HS_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA_HS_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg								
RA_HS_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg								
RA_HS_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg								
RA_HS_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg								
RA_HS_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg								
RA_HS_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg								
RA_HS_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg								
RA_HS_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg								
RA_HS_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg								
RA_HS_SVOCs	2-Chlorophenol	95-57-8	mg/kg								
RA_HS_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg								
RA_HS_SVOCs	2-Methylphenol	95-48-7	mg/kg								
RA_HS_SVOCs	2-Nitroaniline	88-74-4	mg/kg								
RA_HS_SVOCs	2-Nitrophenol	88-75-5	mg/kg								

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-1	SSH-1	SSH-1	SSH-2	SSH-2	SSH-3	SSH-3
				Sample Type Code	N	N	FD	N	N	N	N
				Sample ID	SSH-1A 0-1	SSH-1A 1-2	SSH-1A 0-1DUP	SSH-2A 0-1	SSH-2A 1-2	SSH-3A 0-1	SSH-3A 1-2
				Sample Date	11/30/2011	11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg								
RA_HS_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg								
RA_HS_SVOCs	3-Nitroaniline	99-09-2	mg/kg								
RA_HS_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg								
RA_HS_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg								
RA_HS_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg								
RA_HS_SVOCs	4-Chloroaniline	106-47-8	mg/kg								
RA_HS_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg								
RA_HS_SVOCs	4-Nitroaniline	100-01-6	mg/kg								
RA_HS_SVOCs	4-Nitrophenol	100-02-7	mg/kg								
RA_HS_SVOCs	Acenaphthene	83-32-9	mg/kg								
RA_HS_SVOCs	Acenaphthylene	208-96-8	mg/kg								
RA_HS_SVOCs	Anthracene	120-12-7	mg/kg								
RA_HS_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg								
RA_HS_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg								
RA_HS_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg								
RA_HS_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg								
RA_HS_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg								
RA_HS_SVOCs	Benzoic acid	65-85-0	mg/kg								
RA_HS_SVOCs	Benzyl Alcohol	100-51-6	mg/kg								
RA_HS_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg								
RA_HS_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg								
RA_HS_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg								
RA_HS_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg								
RA_HS_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg								
RA_HS_SVOCs	Carbazole	86-74-8	mg/kg								
RA_HS_SVOCs	Chrysene	218-01-9	mg/kg								
RA_HS_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg								
RA_HS_SVOCs	Dibenzofuran	132-64-9	mg/kg								
RA_HS_SVOCs	Diethyl Phthalate	84-66-2	mg/kg								
RA_HS_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg								
RA_HS_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg								
RA_HS_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg								
RA_HS_SVOCs	Fluoranthene	206-44-0	mg/kg								
RA_HS_SVOCs	Fluorene	86-73-7	mg/kg								
RA_HS_SVOCs	Hexachlorobenzene	118-74-1	mg/kg								
RA_HS_SVOCs	Hexachloroethane	67-72-1	mg/kg								
RA_HS_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg								
RA_HS_SVOCs	Isophorone	78-59-1	mg/kg								
RA_HS_SVOCs	Naphthalene	91-20-3	mg/kg								
RA_HS_SVOCs	Nitrobenzene	98-95-3	mg/kg								
RA_HS_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg								
RA_HS_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg								
RA_HS_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg								
RA_HS_SVOCs	Pentachlorophenol	87-86-5	mg/kg								
RA_HS_SVOCs	Phenanthrene	85-01-8	mg/kg								
RA_HS_SVOCs	Phenol	108-95-2	mg/kg								
RA_HS_SVOCs	Pyrene	129-00-0	mg/kg								
RA_HS_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg								
RA_HS_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg								
RA_HS_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg								
RA_HS_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U	
RA_HS_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U	

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-1	SSH-1	SSH-1	SSH-2	SSH-2	SSH-3	SSH-3
				Sample Type Code	N	N	FD	N	N	N	N
				Sample ID	SSH-1A 0-1	SSH-1A 1-2	SSH-1A 0-1DUP	SSH-2A 0-1	SSH-2A 1-2	SSH-3A 0-1	SSH-3A 1-2
				Sample Date	11/30/2011	11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,1-Dichloroethane	75-34-3	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,1-Dichloroethene	75-35-4	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,1-Dichloropropene	563-58-6	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,2-Dibromoethane	106-93-4	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,2-Dichloroethane	107-06-2	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,2-Dichloropropane	78-87-5	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,3-Dichloropropane	142-28-9	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	2,2-Dichloropropane	594-20-7	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	2-Butanone (MEK)	78-93-3	mg/kg	0.0105 J	0.025 J		0.136 U	0.0161 J	0.0125 J	0.0119 J
RA_HS_VOCs	2-Chlorotoluene	95-49-8	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	2-Hexanone	591-78-6	mg/kg	0.117 U	0.143 U		0.136 U	0.179 U	0.161 U	0.203 U
RA_HS_VOCs	4-Chlorotoluene	106-43-4	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	4-Isopropyltoluene	99-87-6	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.117 U	0.143 U		0.136 U	0.179 U	0.161 U	0.203 U
RA_HS_VOCs	Acetone	67-64-1	mg/kg	0.117 U	0.338		0.119 J	0.287	0.238	0.117 J
RA_HS_VOCs	Benzene	71-43-2	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Bromobenzene	108-86-1	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Bromochloromethane	74-97-5	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Bromodichloromethane	75-27-4	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Bromoform	75-25-2	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Bromomethane	74-83-9	mg/kg	0.0235 U	0.0286 U		0.0272 U	0.0357 U	0.0323 U	0.0406 U
RA_HS_VOCs	Carbon Disulfide	75-15-0	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.011 J	0.0319	0.0136 J
RA_HS_VOCs	Carbon Tetrachloride	56-23-5	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Chlorobenzene	108-90-7	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Chloroethane	75-00-3	mg/kg	0.0235 U	0.0286 U		0.0272 U	0.0357 U	0.0323 U	0.0406 U
RA_HS_VOCs	Chloroform	67-66-3	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Chloromethane	74-87-3	mg/kg	0.0235 U	0.0286 U		0.0272 U	0.0357 U	0.0323 U	0.0406 U
RA_HS_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	dibromochloromethane	124-48-1	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Dibromomethane	74-95-3	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0235 U	0.0286 U		0.0272 U	0.0357 U	0.0323 U	0.0406 U
RA_HS_VOCs	Ethylbenzene	100-41-4	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Hexachlorobutadiene	87-68-3	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Isopropylbenzene	98-82-8	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	M,P-Xylenes	179601-23-1	mg/kg	0.0235 U	0.0286 U		0.0272 U	0.0357 U	0.0323 U	0.0406 U
RA_HS_VOCs	Methylene Chloride	75-09-2	mg/kg	0.0586 U	0.0714 U		0.0679 U	0.0893 U	0.0807 U	0.101 U
RA_HS_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Naphthalene	91-20-3	mg/kg	11.7 U	14.3 U		13.6 U	17.9 U	16.1 U	20.3 U
RA_HS_VOCs	n-Butylbenzene	104-51-8	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	n-Propylbenzene	103-65-1	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	O-Xylene	95-47-6	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-1	SSH-1	SSH-1	SSH-2	SSH-2	SSH-3	SSH-3
				Sample Type Code	N	N	FD	N	N	N	N
				Sample ID	SSH-1A 0-1	SSH-1A 1-2	SSH-1A 0-1DUP	SSH-2A 0-1	SSH-2A 1-2	SSH-3A 0-1	SSH-3A 1-2
				Sample Date	11/30/2011	11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_VOCs	sec-Butylbenzene	135-98-8	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Styrene	100-42-5	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	tert-Butylbenzene	98-06-6	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Tetrachloroethene	127-18-4	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Toluene	108-88-3	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.035 U	0.043 U		0.041 U	0.054 U	0.048 U	0.061 U
RA_HS_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Trichloroethylene	79-01-6	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Trichlorofluoromethane	75-69-4	mg/kg	0.0117 U	0.0143 U		0.0136 U	0.0179 U	0.0161 U	0.0203 U
RA_HS_VOCs	Vinyl Chloride	75-01-4	mg/kg	0.0235 U	0.0286 U		0.0272 U	0.0357 U	0.0323 U	0.0406 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-3	SSH-301	SSH-301	SSH-301	SSH-302	SSH-302	SSH-302
				Sample Type Code	FD	N	N	FD	N	N	FD
				Sample ID	SSH-3A-D 0-1	SSH-301-CI19-0-1	SSH-301-CI19-1-2	SSH-301-CI19-0-1-DUP	SSH-302-CI19-0-1	SSH-302-CI19-1-2	SSH-302-CI19-1-2-DUP
				Sample Date	11/29/2011	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019
				Depth Interval	0 - 1 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	0 - 1 ft	1 - 2 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_Metals	Aluminum	7429-90-5	mg/kg		19000	12500	24900	9400	4570 J	9260 J	
RA_HS_Metals	Antimony	7440-36-0	mg/kg		0.210	0.320 J	0.330	0.300 J	0.2 U	0.540	
RA_HS_Metals	Arsenic	7440-38-2	mg/kg	2.9 J	11.1	6.70	14.6	5.00	1.90 J	6.94 J	
RA_HS_Metals	Barium	7440-39-3	mg/kg	5 J	18.1	14.6	24.6	9.44	5.18 J	12.8 J	
RA_HS_Metals	Beryllium	7440-41-7	mg/kg		1.05	0.894	1.33	1.01	0.448	0.498	
RA_HS_Metals	Cadmium	7440-43-9	mg/kg	0.2 J	0.244	0.0940 J	0.239 J	0.410 J	0.0900 J	1.72 J	
RA_HS_Metals	Calcium	7440-70-2	mg/kg		1820	6650	2500	5230	7680 J	3680 J	
RA_HS_Metals	Chromium	7440-47-3	mg/kg	10.7	23.8	17.8	32.7	10.9	5.91 J	22.4 J	
RA_HS_Metals	Cobalt	7440-48-4	mg/kg		6.32	2.70	7.35	2.82	1.18 J	4.17 J	
RA_HS_Metals	Copper	7440-50-8	mg/kg		24.5	9.72	36.2	6.78	2.80 J	28.6 J	
RA_HS_Metals	Iron	7439-89-6	mg/kg		20400	12000	24800	10600	2800 J	10200 J	
RA_HS_Metals	Lead	7439-92-1	mg/kg	38	110 J	25.0	188 J	12.8	4.23 J	141 J	
RA_HS_Metals	Magnesium	7439-95-4	mg/kg		4880	9480	6370	8020	10300	7660	
RA_HS_Metals	Manganese	7439-96-5	mg/kg		186	142	224	65.9	40.6 J	89.7 J	
RA_HS_Metals	Mercury	7439-97-6	mg/kg	0.03 J	0.0690 J	0.0940 J	0.143	0.210 J	0.0330 J	0.0560 J	
RA_HS_Metals	Nickel	7440-02-0	mg/kg		15.9	9.92	19.5	10.0	4.32 J	25.9 J	
RA_HS_Metals	Potassium	7440-09-7	mg/kg		1560	2560	2170	2260	1700 J	2610 J	
RA_HS_Metals	Selenium	7782-49-2	mg/kg	11.9 U	0.610 J	1.10 J	0.952 J	0.730 J	0.800 J	1.10 J	
RA_HS_Metals	Silver	7440-22-4	mg/kg	1.2 U	0.237	0.0990 J	0.330	0.0380 J	0.16 U	0.302 J	
RA_HS_Metals	Sodium	7440-23-5	mg/kg		6780	34400	9260	34700	37800	41600	
RA_HS_Metals	Thallium	7440-28-0	mg/kg		0.234	0.24 U	0.250	0.130 J	0.0440 J	0.220 J	
RA_HS_Metals	Vanadium	7440-62-2	mg/kg		32.2	29.7	46.4	24.3	11.0 J	46.1 J	
RA_HS_Metals	Zinc	7440-66-6	mg/kg		95.3	32.3	114	26.9	6.91 J	142 J	
RA_HS_Other	Total Organic Carbon	TOC	mg/kg	203000	100000	320000	120000				
RA_HS_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.14 U	0.018 U	0.067 U	0.024 U	0.056 U	0.054 U	0.058 UJ	
RA_HS_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.14 U	0.018 U	0.067 U	0.024 U	0.056 U	0.054 U	0.058 UJ	
RA_HS_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.14 U	0.022 U	0.079 U	0.029 U	0.066 U	0.063 U	0.068 UJ	
RA_HS_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.14 U	0.018 U	0.067 U	0.024 U	0.056 U	0.054 U	0.058 UJ	
RA_HS_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.14 U	0.018 U	0.067 U	0.024 U	0.056 U	0.054 U	0.058 UJ	
RA_HS_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.14 U	0.018 U	0.067 U	0.024 U	0.056 U	0.054 U	0.058 UJ	
RA_HS_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.0531 J	0.13 J	0.067 U	0.58 J	0.23 J	0.054 U	0.058 UJ	
RA_HS_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg	0.14 U							
RA_HS_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg	0.14 U							
RA_HS_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg		0.13 J	0.48 U	0.58	0.23 J	0.39 U	0.41 UJ	
RA_HS_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	1.2	0.24	0.48 U	0.73	0.58	0.39 U	0.42 U	
RA_HS_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U	
RA_HS_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U	
RA_HS_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U	
RA_HS_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U	
RA_HS_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg		0.47 J	0.075 U	0.2 J	0.0740 J	0.064 U	0.062 U	
RA_HS_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg		1.2 U	4.6 U	1.7 U	4 U	4 U	4.1 U	
RA_HS_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg		0.51 U	1.8 U	0.68 U	1.6 U	1.6 U	1.6 U	
RA_HS_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg		0.51 U	1.8	0.68	1.6	1.6	1.6 U	
RA_HS_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg		0.51 UJ	1.8 UJ	0.68 UJ	1.6 UJ	1.6 UJ	1.6 U	
RA_HS_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg		1.2 UJ	4.6 UJ	1.7 UJ	4 UJ	4 UJ	4.1 UJ	
RA_HS_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U	
RA_HS_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U	
RA_HS_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg		0.51 UJ	1.8 UJ	0.68 UJ	1.6 UJ	1.6 UJ	1.6 U	
RA_HS_SVOCs	2-Chlorophenol	95-57-8	mg/kg		0.51 U	1.8 U	0.68 U	1.6 U	1.6 U	1.6 U	
RA_HS_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg		0.46 J	0.075 U	0.2 J	0.1 J	0.064 U	0.062 U	
RA_HS_SVOCs	2-Methylphenol	95-48-7	mg/kg		0.51 U	1.8 U	0.68 U	1.6 U	1.6 U	1.6 U	
RA_HS_SVOCs	2-Nitroaniline	88-74-4	mg/kg		1.2 UJ	4.6 UJ	1.7 UJ	4 UJ	4 UJ	4.1 U	
RA_HS_SVOCs	2-Nitrophenol	88-75-5	mg/kg		0.51 U	1.8 U	0.68 U	1.6 U	1.6 U	1.6 U	

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-3	SSH-301	SSH-301	SSH-301	SSH-302	SSH-302	SSH-302
				Sample Type Code	FD	N	N	FD	N	N	FD
				Sample ID	SSH-3A-D 0-1	SSH-301-CI19-0-1	SSH-301-CI19-1-2	SSH-301-CI19-0-1-DUP	SSH-302-CI19-0-1	SSH-302-CI19-1-2	SSH-302-CI19-1-2-DUP
				Sample Date	11/29/2011	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019
				Depth Interval	0 - 1 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	0 - 1 ft	1 - 2 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg		0.51 UJ	1.8 UJ	0.68 UJ	1.6 UJ	1.6 UJ	1.6 U
RA_HS_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	3-Nitroaniline	99-09-2	mg/kg		1.2 U	4.6 U	1.7 U	4 UJ	4 U	4.1 U
RA_HS_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg		1.2 U	4.6 U	1.7 U	4 U	4 U	4.1 U
RA_HS_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg		0.51 U	1.8 U	0.68 U	1.6 U	1.6 U	1.6 U
RA_HS_SVOCs	4-Chloroaniline	106-47-8	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	4-Nitroaniline	100-01-6	mg/kg		1.2 U	4.6 U	1.7 U	4 UJ	4 U	4.1 U
RA_HS_SVOCs	4-Nitrophenol	100-02-7	mg/kg		1.2 U	4.6 U	1.7 U	4 U	4 U	4.1 U
RA_HS_SVOCs	Acenaphthene	83-32-9	mg/kg		0.0620	0.075 U	0.0320 J	0.0190 J	0.064 U	0.062 U
RA_HS_SVOCs	Acenaphthylene	208-96-8	mg/kg		0.0630	0.075 U	0.0440 J	0.0320 J	0.064 U	0.062 U
RA_HS_SVOCs	Anthracene	120-12-7	mg/kg		0.14	0.075 U	0.0660	0.065 U	0.064 U	0.062 U
RA_HS_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg		1.5 J	0.075 U	0.6 J	0.44	0.064 U	0.062 U
RA_HS_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg		2.1 J	0.0520 J	0.88 J	0.64	0.064 U	0.062 U
RA_HS_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg		2.2 J	0.12 J	0.98 J	0.79	0.0670 J	0.0590 J
RA_HS_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg		0.99 J	0.075 U	0.48 J	0.39	0.064 U	0.062 U
RA_HS_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg		0.54 J	0.075 U	0.28 J	0.18	0.064 U	0.062 U
RA_HS_SVOCs	Benzoic acid	65-85-0	mg/kg		1.2 UJ	4.6 UJ	1.7 UJ	4 UJ	4 UJ	4.1 U
RA_HS_SVOCs	Benzyl Alcohol	100-51-6	mg/kg		1 U	3.7 U	1.4 U	3.2 UJ	3.2 U	3.3 U
RA_HS_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg		0.51 UJ	1.8 UJ	0.68 UJ	1.6 UJ	1.6 UJ	1.6 U
RA_HS_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg		0.51 UJ	1.8 UJ	0.68 UJ	1.6 UJ	1.6 UJ	1.6 U
RA_HS_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Carbazole	86-74-8	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Chrysene	218-01-9	mg/kg		2.7 J	0.075 U	1.1 J	0.87	0.064 U	0.062 U
RA_HS_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg		0.25 J	0.075 U	0.16 J	0.0800 J	0.064 U	0.062 U
RA_HS_SVOCs	Dibenzofuran	132-64-9	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Diethyl Phthalate	84-66-2	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Fluoranthene	206-44-0	mg/kg		2.4 J	0.075 U	0.91 J	0.8	0.064 U	0.062 U
RA_HS_SVOCs	Fluorene	86-73-7	mg/kg		0.29 J	0.075 U	0.15 J	0.0820 J	0.064 U	0.062 U
RA_HS_SVOCs	Hexachlorobenzene	118-74-1	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Hexachloroethane	67-72-1	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg		0.89	0.0510 J	0.42	0.34	0.0250 J	0.0260 J
RA_HS_SVOCs	Isophorone	78-59-1	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Naphthalene	91-20-3	mg/kg		0.7 J	0.075 U	0.32 J	0.21	0.064 U	0.062 U
RA_HS_SVOCs	Nitrobenzene	98-95-3	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg		0.51 UJ	1.8 UJ	0.68 UJ	1.6 UJ	1.6 UJ	1.6 U
RA_HS_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg		0.51 U	1.8 U	0.68 U	1.6 UJ	1.6 U	1.6 U
RA_HS_SVOCs	Pentachlorophenol	87-86-5	mg/kg		1.2 U	4.6 U	1.7 U	4 U	4 U	4.1 U
RA_HS_SVOCs	Phenanthrene	85-01-8	mg/kg		3.9 J	0.11 J	1.8 J	1.1	0.0230 J	0.062 U
RA_HS_SVOCs	Phenol	108-95-2	mg/kg		0.51 UJ	1.8 UJ	0.68 UJ	1.6 UJ	1.6 UJ	1.6 U
RA_HS_SVOCs	Pyrene	129-00-0	mg/kg		4.3 J	0.0920 J	1.7 J	1.1	0.064 U	0.062 U
RA_HS_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg		18	0.62	7.5	5.6	0.29	0.43
RA_HS_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg		6.1	0.64	2.8	1.6	0.47	0.50 U
RA_HS_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg		24	1.1	10	7.3	0.48	0.77
RA_HS_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0151 U						
RA_HS_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0151 U						

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-3	SSH-301	SSH-301	SSH-301	SSH-302	SSH-302	SSH-302
				Sample Type Code	FD	N	N	FD	N	N	FD
				Sample ID	SSH-3A-D 0-1	SSH-301-CI19-0-1	SSH-301-CI19-1-2	SSH-301-CI19-0-1-DUI	SSH-302-CI19-0-1	SSH-302-CI19-1-2	SSH-302-CI19-1-2-DUI
				Sample Date	11/29/2011	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019
				Depth Interval	0 - 1 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	0 - 1 ft	1 - 2 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0151 U							
RA_HS_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0151 U							
RA_HS_VOCs	1,1-Dichloroethane	75-34-3	mg/kg	0.0151 U							
RA_HS_VOCs	1,1-Dichloroethene	75-35-4	mg/kg	0.0151 U							
RA_HS_VOCs	1,1-Dichloropropene	563-58-6	mg/kg	0.0151 U							
RA_HS_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0151 U							
RA_HS_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0151 U							
RA_HS_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0151 U							
RA_HS_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0151 U							
RA_HS_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0151 U							
RA_HS_VOCs	1,2-Dibromoethane	106-93-4	mg/kg	0.0151 U							
RA_HS_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0151 U							
RA_HS_VOCs	1,2-Dichloroethane	107-06-2	mg/kg	0.0151 U							
RA_HS_VOCs	1,2-Dichloropropane	78-87-5	mg/kg	0.0151 U							
RA_HS_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0151 U							
RA_HS_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0151 U							
RA_HS_VOCs	1,3-Dichloropropane	142-28-9	mg/kg	0.0151 U							
RA_HS_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0151 U							
RA_HS_VOCs	2,2-Dichloropropane	594-20-7	mg/kg	0.0151 U							
RA_HS_VOCs	2-Butanone (MEK)	78-93-3	mg/kg	0.151 U							
RA_HS_VOCs	2-Chlorotoluene	95-49-8	mg/kg	0.0151 U							
RA_HS_VOCs	2-Hexanone	591-78-6	mg/kg	0.151 U							
RA_HS_VOCs	4-Chlorotoluene	106-43-4	mg/kg	0.0151 U							
RA_HS_VOCs	4-Isopropyltoluene	99-87-6	mg/kg	0.0151 U							
RA_HS_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.151 U							
RA_HS_VOCs	Acetone	67-64-1	mg/kg	0.167							
RA_HS_VOCs	Benzene	71-43-2	mg/kg	0.0151 U							
RA_HS_VOCs	Bromobenzene	108-86-1	mg/kg	0.0151 U							
RA_HS_VOCs	Bromochloromethane	74-97-5	mg/kg	0.0151 U							
RA_HS_VOCs	Bromodichloromethane	75-27-4	mg/kg	0.0151 U							
RA_HS_VOCs	Bromoform	75-25-2	mg/kg	0.0151 U							
RA_HS_VOCs	Bromomethane	74-83-9	mg/kg	0.0302 U							
RA_HS_VOCs	Carbon Disulfide	75-15-0	mg/kg	0.0052 J							
RA_HS_VOCs	Carbon Tetrachloride	56-23-5	mg/kg	0.0151 U							
RA_HS_VOCs	Chlorobenzene	108-90-7	mg/kg	0.0151 U							
RA_HS_VOCs	Chloroethane	75-00-3	mg/kg	0.0302 U							
RA_HS_VOCs	Chloroform	67-66-3	mg/kg	0.0151 U							
RA_HS_VOCs	Chloromethane	74-87-3	mg/kg	0.0302 U							
RA_HS_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0151 U							
RA_HS_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0151 U							
RA_HS_VOCs	dibromochloromethane	124-48-1	mg/kg	0.0151 U							
RA_HS_VOCs	Dibromomethane	74-95-3	mg/kg	0.0151 U							
RA_HS_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0302 U							
RA_HS_VOCs	Ethylbenzene	100-41-4	mg/kg	0.0151 U							
RA_HS_VOCs	Hexachlorobutadiene	87-68-3	mg/kg	0.0151 U							
RA_HS_VOCs	Isopropylbenzene	98-82-8	mg/kg	0.0151 U							
RA_HS_VOCs	M,P-Xylenes	179601-23-1	mg/kg	0.0302 U							
RA_HS_VOCs	Methylene Chloride	75-09-2	mg/kg	0.0755 U							
RA_HS_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0151 U							
RA_HS_VOCs	Naphthalene	91-20-3	mg/kg	15.1 U							
RA_HS_VOCs	n-Butylbenzene	104-51-8	mg/kg	0.0151 U							
RA_HS_VOCs	n-Propylbenzene	103-65-1	mg/kg	0.0151 U							
RA_HS_VOCs	O-Xylene	95-47-6	mg/kg	0.0151 U							

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-3	SSH-301	SSH-301	SSH-301	SSH-302	SSH-302	SSH-302
				Sample Type Code	FD	N	N	FD	N	N	FD
				Sample ID	SSH-3A-D 0-1	SSH-301-CI19-0-1	SSH-301-CI19-1-2	SSH-301-CI19-0-1-DUP	SSH-302-CI19-0-1	SSH-302-CI19-1-2	SSH-302-CI19-1-2-DUP
				Sample Date	11/29/2011	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019
				Depth Interval	0 - 1 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	0 - 1 ft	1 - 2 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_VOCs	sec-Butylbenzene	135-98-8	mg/kg	0.0151 U							
RA_HS_VOCs	Styrene	100-42-5	mg/kg	0.0151 U							
RA_HS_VOCs	tert-Butylbenzene	98-06-6	mg/kg	0.0151 U							
RA_HS_VOCs	Tetrachloroethene	127-18-4	mg/kg	0.0151 U							
RA_HS_VOCs	Toluene	108-88-3	mg/kg	0.0151 U							
RA_HS_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.045 U							
RA_HS_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0151 U							
RA_HS_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0151 U							
RA_HS_VOCs	Trichloroethylene	79-01-6	mg/kg	0.0151 U							
RA_HS_VOCs	Trichlorofluoromethane	75-69-4	mg/kg	0.0151 U							
RA_HS_VOCs	Vinyl Chloride	75-01-4	mg/kg	0.0302 U							

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-303	SSH-303	SSH-304	SSH-304	SSH-305	SSH-305	SSH-306
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SSH-303-CI19-0-1	SSH-303-CI19-1-2	SSH-304-CI19-0-1	SSH-304-CI19-1-2	SSH-305-CI19-0-1	SSH-305-CI19-1-2	SSH-306-CI19-0-1
				Sample Date	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_Metals	Aluminum	7429-90-5	mg/kg	4910	7940	9220	5390	7720	10500	8390	
RA_HS_Metals	Antimony	7440-36-0	mg/kg	1.16	0.140 J	0.606	0.440	0.400 J	0.250 J	0.240	
RA_HS_Metals	Arsenic	7440-38-2	mg/kg	13.9	2.70	15.7	8.20	10.2	4.00	5.26	
RA_HS_Metals	Barium	7440-39-3	mg/kg	9.50	9.69	15.5	9.32	13.6	13.1	13.0	
RA_HS_Metals	Beryllium	7440-41-7	mg/kg	0.11 U	0.669	0.740	0.525	0.091 U	0.917	0.538	
RA_HS_Metals	Cadmium	7440-43-9	mg/kg	0.968	0.0650 J	2.38	0.100 J	0.160 J	0.170 J	0.130 J	
RA_HS_Metals	Calcium	7440-70-2	mg/kg	3620	6640	1830	2420	3200	4940	2200	
RA_HS_Metals	Chromium	7440-47-3	mg/kg	18.3	9.42	23.6	21.6	23.2	13.2	19.7	
RA_HS_Metals	Cobalt	7440-48-4	mg/kg	2.58	1.34	8.51	4.07	2.46	2.87	2.65	
RA_HS_Metals	Copper	7440-50-8	mg/kg	32.5	5.65	44.0	18.5	30.3	6.36	24.2	
RA_HS_Metals	Iron	7439-89-6	mg/kg	9490	5810	19300	13600	11600	7570	8920	
RA_HS_Metals	Lead	7439-92-1	mg/kg	141	8.73	277	41.2	50.5	24.1	89.4	
RA_HS_Metals	Magnesium	7439-95-4	mg/kg	8090	9410	3910	4640	7180	7850	4120	
RA_HS_Metals	Manganese	7439-96-5	mg/kg	67.4	51.0	98.8	54.5	92.8	67.2	84.2	
RA_HS_Metals	Mercury	7439-97-6	mg/kg	0.110 J	0.0510 J	0.143	0.268	0.100 J	0.092 U	0.143	
RA_HS_Metals	Nickel	7440-02-0	mg/kg	17.0	7.59	30.4	12.3	12.2	13.6	10.7	
RA_HS_Metals	Potassium	7440-09-7	mg/kg	2460	2190	1750	1840	2520	2440	1810	
RA_HS_Metals	Selenium	7782-49-2	mg/kg	1.00 J	0.630 J	0.670 J	0.700 J	0.850 J	0.740 J	0.660 J	
RA_HS_Metals	Silver	7440-22-4	mg/kg	0.481 J	0.0430 J	0.391	0.0930 J	0.359 J	0.0400 J	0.238	
RA_HS_Metals	Sodium	7440-23-5	mg/kg	48000	37600	12300	22800	38800	35600	15400	
RA_HS_Metals	Thallium	7440-28-0	mg/kg	0.140 J	0.21 U	0.266	0.0290 J	0.140 J	0.130 J	0.0770 J	
RA_HS_Metals	Vanadium	7440-62-2	mg/kg	53.3	20.3	45.8	25.9	42.7	29.3	34.9	
RA_HS_Metals	Zinc	7440-66-6	mg/kg	215	15.2	256	52.4	49.4	33.1	39.3	
RA_HS_Other	Total Organic Carbon	TOC	mg/kg	290000	470000			280000	300000		
RA_HS_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.064 UJ	0.053 U	0.021 UJ	0.031 U	0.04 U	0.04 UJ	0.02 U	
RA_HS_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.064 UJ	0.053 U	0.021 UJ	0.031 U	0.04 U	0.04 UJ	0.02 U	
RA_HS_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.076 UJ	0.062 U	0.024 UJ	0.036 U	0.047 U	0.048 UJ	0.024 U	
RA_HS_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.064 UJ	0.053 U	0.021 UJ	0.031 U	0.04 U	0.04 UJ	0.02 U	
RA_HS_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.064 UJ	0.053 U	0.021 UJ	0.031 U	0.04 U	0.04 UJ	0.02 U	
RA_HS_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.064 UJ	0.053 U	0.021 UJ	0.031 U	0.04 U	0.04 UJ	0.02 U	
RA_HS_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.064 UJ	0.053 U	0.021 UJ	0.031 U	0.13 J	0.04 UJ	0.02 U	
RA_HS_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg								
RA_HS_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg								
RA_HS_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.46 UJ	0.38 U	0.15 UJ	0.22 U	0.13 J	0.29 UJ	0.14 U	
RA_HS_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.46 U	0.38 U	0.15 U	0.22 U	0.38	0.29 U	0.14 U	
RA_HS_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U	
RA_HS_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U	
RA_HS_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U	
RA_HS_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U	
RA_HS_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg	0.071 U	0.051 U	0.0240 J	0.04 U	0.0520 J	0.048 U	0.00870 J	
RA_HS_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg	4.4 U	3.1 U	1.4 U	2.4 U	2.7 U	3 U	1.7 U	
RA_HS_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg	1.8 U	1.3 U	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U	
RA_HS_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg	1.8	1.3	0.58	0.98	1.1	1.2	0.69	
RA_HS_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg	1.8 UJ	1.3 UJ	0.58 UJ	0.98 UJ	1.1 UJ	1.2 UJ	0.69 UJ	
RA_HS_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg	4.4 UJ	3.1 UJ	1.4 UJ	2.4 UJ	2.7 UJ	3 UJ	1.7 UJ	
RA_HS_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U	
RA_HS_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U	
RA_HS_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg	1.8 UJ	1.3 UJ	0.58 UJ	0.98 UJ	1.1 UJ	1.2 UJ	0.69 UJ	
RA_HS_SVOCs	2-Chlorophenol	95-57-8	mg/kg	1.8 U	1.3 U	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U	
RA_HS_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg	0.0450 J	0.051 U	0.0520	0.04 U	0.0510 J	0.048 U	0.0110 J	
RA_HS_SVOCs	2-Methylphenol	95-48-7	mg/kg	1.8 U	1.3 U	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U	
RA_HS_SVOCs	2-Nitroaniline	88-74-4	mg/kg	4.4 UJ	3.1 UJ	1.4 UJ	2.4 UJ	2.7 UJ	3 UJ	1.7 UJ	
RA_HS_SVOCs	2-Nitrophenol	88-75-5	mg/kg	1.8 U	1.3 U	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U	

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-303	SSH-303	SSH-304	SSH-304	SSH-305	SSH-305	SSH-306
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SSH-303-CI19-0-1	SSH-303-CI19-1-2	SSH-304-CI19-0-1	SSH-304-CI19-1-2	SSH-305-CI19-0-1	SSH-305-CI19-1-2	SSH-306-CI19-0-1
				Sample Date	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg	1.8 UJ	1.3 UJ	0.58 UJ	0.98 UJ	1.1 UJ	1.2 UJ	0.69 UJ
RA_HS_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	3-Nitroaniline	99-09-2	mg/kg	4.4 U	3.1 UJ	1.4 U	2.4 U	2.7 U	3 U	1.7 U
RA_HS_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	4.4 U	3.1 U	1.4 U	2.4 U	2.7 U	3 U	1.7 U
RA_HS_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	1.8 U	1.3 U	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	4-Chloroaniline	106-47-8	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	4-Nitroaniline	100-01-6	mg/kg	4.4 U	3.1 UJ	1.4 U	2.4 U	2.7 U	3 U	1.7 U
RA_HS_SVOCs	4-Nitrophenol	100-02-7	mg/kg	4.4 U	3.1 U	1.4 U	2.4 U	2.7 U	3 U	1.7 U
RA_HS_SVOCs	Acenaphthene	83-32-9	mg/kg	0.071 U	0.051 U	0.0270 J	0.04 U	0.044 U	0.048 U	0.028 U
RA_HS_SVOCs	Acenaphthylene	208-96-8	mg/kg	0.071 U	0.051 U	0.0290 J	0.04 U	0.0130 J	0.048 U	0.028 U
RA_HS_SVOCs	Anthracene	120-12-7	mg/kg	0.071 U	0.051 U	0.39	0.04 U	0.0320 J	0.048 U	0.0110 J
RA_HS_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg	0.21	0.051 U	3.6	0.04 U	0.23	0.048 U	0.0670
RA_HS_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg	0.3	0.051 U	3	0.0250 J	0.35	0.0180 J	0.0870
RA_HS_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.52	0.051 U	4.3	0.04 U	0.49	0.0350 J	0.16
RA_HS_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.17	0.051 U	1.6	0.04 U	0.23	0.048 U	0.0510 J
RA_HS_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.0740 J	0.051 U	1.8	0.04 U	0.15	0.048 U	0.0540 J
RA_HS_SVOCs	Benzoic acid	65-85-0	mg/kg	4.4 UJ	3.1 UJ	1.4 UJ	2.4 UJ	2.7 UJ	3 UJ	1.7 UJ
RA_HS_SVOCs	Benzyl Alcohol	100-51-6	mg/kg	3.5 U	2.5 UJ	1.2 U	2 U	2.2 U	2.4 U	1.4 U
RA_HS_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	1.8 UJ	1.3 UJ	0.58 UJ	0.98 UJ	1.1 UJ	1.2 UJ	0.69 UJ
RA_HS_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	1.8 UJ	1.3 UJ	0.58 UJ	0.98 UJ	1.1 UJ	1.2 UJ	0.69 UJ
RA_HS_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Carbazole	86-74-8	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Chrysene	218-01-9	mg/kg	0.37	0.051 U	3.9	0.04 U	0.44	0.048 U	0.1
RA_HS_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.0190 J	0.051 U	0.49	0.00820 J	0.0660 J	0.048 U	0.0170 J
RA_HS_SVOCs	Dibenzofuran	132-64-9	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Diethyl Phthalate	84-66-2	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Fluoranthene	206-44-0	mg/kg	0.48	0.051 U	8.2	0.04 U	0.52	0.048 U	0.17
RA_HS_SVOCs	Fluorene	86-73-7	mg/kg	0.0410 J	0.051 U	0.14	0.04 U	0.0400 J	0.048 U	0.028 U
RA_HS_SVOCs	Hexachlorobenzene	118-74-1	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Hexachloroethane	67-72-1	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.18	0.0190 J	3.3	0.0260 J	0.23	0.0160 J	0.0640
RA_HS_SVOCs	Isophorone	78-59-1	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Naphthalene	91-20-3	mg/kg	0.0730 J	0.051 U	0.0630	0.04 U	0.0910	0.048 U	0.028 U
RA_HS_SVOCs	Nitrobenzene	98-95-3	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	1.8 UJ	1.3 UJ	0.58 UJ	0.98 UJ	1.1 UJ	1.2 UJ	0.69 UJ
RA_HS_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	1.8 U	1.3 UJ	0.58 U	0.98 U	1.1 U	1.2 U	0.69 U
RA_HS_SVOCs	Pentachlorophenol	87-86-5	mg/kg	4.4 U	3.1 U	1.4 U	2.4 U	2.7 U	3 U	1.7 U
RA_HS_SVOCs	Phenanthrene	85-01-8	mg/kg	0.51	0.051 U	1.8	0.0200 J	0.53	0.0170 J	0.1
RA_HS_SVOCs	Phenol	108-95-2	mg/kg	1.8 UJ	1.3 UJ	0.58 UJ	0.98 UJ	1.1 UJ	1.2 UJ	0.69 UJ
RA_HS_SVOCs	Pyrene	129-00-0	mg/kg	0.51	0.051 U	6.8	0.0230 J	0.73	0.048 U	0.13
RA_HS_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	2.8	0.48	37	0.21	3.4	0.23	0.90
RA_HS_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.84	0.41 U	2.5	0.30	0.84	0.35	0.17
RA_HS_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg	3.6	0.89	40	0.37	4.3	0.39	1.1
RA_HS_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg							
RA_HS_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg							

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-303	SSH-303	SSH-304	SSH-304	SSH-305	SSH-305	SSH-306
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SSH-303-CI19-0-1	SSH-303-CI19-1-2	SSH-304-CI19-0-1	SSH-304-CI19-1-2	SSH-305-CI19-0-1	SSH-305-CI19-1-2	SSH-306-CI19-0-1
				Sample Date	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg								
RA_HS_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg								
RA_HS_VOCs	1,1-Dichloroethane	75-34-3	mg/kg								
RA_HS_VOCs	1,1-Dichloroethene	75-35-4	mg/kg								
RA_HS_VOCs	1,1-Dichloropropene	563-58-6	mg/kg								
RA_HS_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg								
RA_HS_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg								
RA_HS_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA_HS_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg								
RA_HS_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg								
RA_HS_VOCs	1,2-Dibromoethane	106-93-4	mg/kg								
RA_HS_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA_HS_VOCs	1,2-Dichloroethane	107-06-2	mg/kg								
RA_HS_VOCs	1,2-Dichloropropane	78-87-5	mg/kg								
RA_HS_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg								
RA_HS_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA_HS_VOCs	1,3-Dichloropropane	142-28-9	mg/kg								
RA_HS_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA_HS_VOCs	2,2-Dichloropropane	594-20-7	mg/kg								
RA_HS_VOCs	2-Butanone (MEK)	78-93-3	mg/kg								
RA_HS_VOCs	2-Chlorotoluene	95-49-8	mg/kg								
RA_HS_VOCs	2-Hexanone	591-78-6	mg/kg								
RA_HS_VOCs	4-Chlorotoluene	106-43-4	mg/kg								
RA_HS_VOCs	4-Isopropyltoluene	99-87-6	mg/kg								
RA_HS_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg								
RA_HS_VOCs	Acetone	67-64-1	mg/kg								
RA_HS_VOCs	Benzene	71-43-2	mg/kg								
RA_HS_VOCs	Bromobenzene	108-86-1	mg/kg								
RA_HS_VOCs	Bromochloromethane	74-97-5	mg/kg								
RA_HS_VOCs	Bromodichloromethane	75-27-4	mg/kg								
RA_HS_VOCs	Bromoform	75-25-2	mg/kg								
RA_HS_VOCs	Bromomethane	74-83-9	mg/kg								
RA_HS_VOCs	Carbon Disulfide	75-15-0	mg/kg								
RA_HS_VOCs	Carbon Tetrachloride	56-23-5	mg/kg								
RA_HS_VOCs	Chlorobenzene	108-90-7	mg/kg								
RA_HS_VOCs	Chloroethane	75-00-3	mg/kg								
RA_HS_VOCs	Chloroform	67-66-3	mg/kg								
RA_HS_VOCs	Chloromethane	74-87-3	mg/kg								
RA_HS_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg								
RA_HS_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg								
RA_HS_VOCs	dibromochloromethane	124-48-1	mg/kg								
RA_HS_VOCs	Dibromomethane	74-95-3	mg/kg								
RA_HS_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg								
RA_HS_VOCs	Ethylbenzene	100-41-4	mg/kg								
RA_HS_VOCs	Hexachlorobutadiene	87-68-3	mg/kg								
RA_HS_VOCs	Isopropylbenzene	98-82-8	mg/kg								
RA_HS_VOCs	M,P-Xylenes	179601-23-1	mg/kg								
RA_HS_VOCs	Methylene Chloride	75-09-2	mg/kg								
RA_HS_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg								
RA_HS_VOCs	Naphthalene	91-20-3	mg/kg								
RA_HS_VOCs	n-Butylbenzene	104-51-8	mg/kg								
RA_HS_VOCs	n-Propylbenzene	103-65-1	mg/kg								
RA_HS_VOCs	O-Xylene	95-47-6	mg/kg								

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-303	SSH-303	SSH-304	SSH-304	SSH-305	SSH-305	SSH-306
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SSH-303-CI19-0-1	SSH-303-CI19-1-2	SSH-304-CI19-0-1	SSH-304-CI19-1-2	SSH-305-CI19-0-1	SSH-305-CI19-1-2	SSH-306-CI19-0-1
				Sample Date	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_VOCs	sec-Butylbenzene	135-98-8	mg/kg								
RA_HS_VOCs	Styrene	100-42-5	mg/kg								
RA_HS_VOCs	tert-Butylbenzene	98-06-6	mg/kg								
RA_HS_VOCs	Tetrachloroethene	127-18-4	mg/kg								
RA_HS_VOCs	Toluene	108-88-3	mg/kg								
RA_HS_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg								
RA_HS_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg								
RA_HS_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg								
RA_HS_VOCs	Trichloroethylene	79-01-6	mg/kg								
RA_HS_VOCs	Trichlorofluoromethane	75-69-4	mg/kg								
RA_HS_VOCs	Vinyl Chloride	75-01-4	mg/kg								

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-306	SSH-307	SSH-307	SSH-308	SSH-308	SSH-309	SSH-309
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SSH-306-CI19-1-2	SSH-307-CI19-0-1	SSH-307-CI19-1-2	SSH-308-CI19-0-1	SSH-308-CI19-1-2	SSH-309-CI19-0-1	SSH-309-CI19-1-2
				Sample Date	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019
				Depth Interval	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_Metals	Aluminum	7429-90-5	mg/kg	8210	10300	8490	9500	12400	8170	1690
RA_HS_Metals	Antimony	7440-36-0	mg/kg	0.210 J	0.414	0.520	0.290	0.100 J	0.470 J	0.0200 J
RA_HS_Metals	Arsenic	7440-38-2	mg/kg	4.58	9.65	13.3	8.67	4.09	16.3	0.640
RA_HS_Metals	Barium	7440-39-3	mg/kg	8.49	10.9	15.3	16.1	19.5 J	12.3	3.39
RA_HS_Metals	Beryllium	7440-41-7	mg/kg	0.841	0.908	0.750	0.889	1.14	0.669	0.0764
RA_HS_Metals	Cadmium	7440-43-9	mg/kg	0.195 J	0.455	0.745	0.255	0.0510 J	0.0580 J	0.0170 J
RA_HS_Metals	Calcium	7440-70-2	mg/kg	4160	1730	2600	2290	3020	3040	562
RA_HS_Metals	Chromium	7440-47-3	mg/kg	9.16	12.3	25.5	33.4	21.3	20.9	2.36
RA_HS_Metals	Cobalt	7440-48-4	mg/kg	2.26	3.94	4.79	4.03	3.52	2.43	0.296
RA_HS_Metals	Copper	7440-50-8	mg/kg	5.12	18.6	23.8	22.7	5.98	19.0	0.450
RA_HS_Metals	Iron	7439-89-6	mg/kg	8540	16500	18700	16800	9510 J	15300	2590
RA_HS_Metals	Lead	7439-92-1	mg/kg	12.6	49.6	50.8	76.7	10.0 J	46.6 J	1.77
RA_HS_Metals	Magnesium	7439-95-4	mg/kg	6160	3060	4080	5100	6240	5760	778
RA_HS_Metals	Manganese	7439-96-5	mg/kg	57.1	98.5	92.2	106	94.7	85.6	16.3
RA_HS_Metals	Mercury	7439-97-6	mg/kg	0.075 U	0.129	0.120 J	0.147	0.0430 J	0.160	0.02 U
RA_HS_Metals	Nickel	7440-02-0	mg/kg	7.99	18.7	16.9	13.2	11.1	10.4	0.584
RA_HS_Metals	Potassium	7440-09-7	mg/kg	1830	1300	1940	2370	2630	2220	381
RA_HS_Metals	Selenium	7782-49-2	mg/kg	0.600 J	0.420 J	0.850 J	0.690 J	0.540 J	1.00 J	0.0800 J
RA_HS_Metals	Silver	7440-22-4	mg/kg	0.0440 J	0.185	0.200 J	0.130 J	0.0350 J	0.0990 J	0.00740 J
RA_HS_Metals	Sodium	7440-23-5	mg/kg	27400	9770	10200	16400	17200	25600	3700
RA_HS_Metals	Thallium	7440-28-0	mg/kg	0.0850 J	0.110 J	0.13 U	0.095 U	0.120 J	0.12 U	0.026 U
RA_HS_Metals	Vanadium	7440-62-2	mg/kg	21.2	20.5	45.9	31.9	41.9	34.8	6.12
RA_HS_Metals	Zinc	7440-66-6	mg/kg	22.9	108	116	67.6	39.3	38.9	4.24
RA_HS_Other	Total Organic Carbon	TOC	mg/kg		120000	200000			130000	16000
RA_HS_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.034 U	0.021 U	0.032 U	0.022 UJ	0.026 UJ	0.034 UJ	0.011 UJ
RA_HS_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.034 U	0.021 U	0.032 U	0.022 UJ	0.026 UJ	0.034 UJ	0.011 UJ
RA_HS_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.04 U	0.025 U	0.037 U	0.026 UJ	0.03 UJ	0.041 UJ	0.013 UJ
RA_HS_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.034 U	0.021 U	0.032 U	0.022 UJ	0.026 UJ	0.034 UJ	0.011 UJ
RA_HS_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.034 U	0.021 U	0.032 U	0.022 UJ	0.026 UJ	0.034 UJ	0.011 UJ
RA_HS_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.034 U	0.021 U	0.032 U	0.022 UJ	0.026 UJ	0.034 UJ	0.011 UJ
RA_HS_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.034 U	0.11	0.032 U	0.022 UJ	0.026 UJ	0.034 UJ	0.011 UJ
RA_HS_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg							
RA_HS_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg							
RA_HS_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.25 U	0.11 J	0.23 U	0.16 UJ	0.19 UJ	0.25 UJ	0.08 UJ
RA_HS_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.24 U	0.24	0.23 U	0.16 U	0.19 U	0.25 U	0.079 U
RA_HS_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg	0.036 U	0.0410 J	0.038 U	0.028 U	0.029 U	0.041 U	0.013 U
RA_HS_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg	2.2 U	1.4 U	2.3 U	1.7 U	1.8 U	2.5 U	0.81 U
RA_HS_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 U	0.32 U
RA_HS_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg	0.9	0.56	0.94	0.7	0.73	1 U	0.32 U
RA_HS_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg	0.9 UJ	0.56 UJ	0.94 UJ	0.7 UJ	0.73 UJ	1 UJ	0.32 U
RA_HS_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg	2.2 UJ	1.4 UJ	2.3 UJ	1.7 UJ	1.8 UJ	2.5 U	0.81 U
RA_HS_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg	0.9 UJ	0.56 UJ	0.94 UJ	0.7 UJ	0.73 UJ	1 UJ	0.32 U
RA_HS_SVOCs	2-Chlorophenol	95-57-8	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 U	0.32 U
RA_HS_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg	0.036 U	0.0400 J	0.038 U	0.028 U	0.029 U	0.041 U	0.013 U
RA_HS_SVOCs	2-Methylphenol	95-48-7	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 U	0.32 U
RA_HS_SVOCs	2-Nitroaniline	88-74-4	mg/kg	2.2 UJ	1.4 UJ	2.3 UJ	1.7 UJ	1.8 UJ	2.5 UJ	0.81 U
RA_HS_SVOCs	2-Nitrophenol	88-75-5	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 U	0.32 U

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-306	SSH-307	SSH-307	SSH-308	SSH-308	SSH-309	SSH-309
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SSH-306-CI19-1-2	SSH-307-CI19-0-1	SSH-307-CI19-1-2	SSH-308-CI19-0-1	SSH-308-CI19-1-2	SSH-309-CI19-0-1	SSH-309-CI19-1-2
				Sample Date	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019
				Depth Interval	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg	0.9 UJ	0.56 UJ	0.94 UJ	0.7 UJ	0.73 UJ	1 U	0.32 U
RA_HS_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 UJ		0.32 U
RA_HS_SVOCs	3-Nitroaniline	99-09-2	mg/kg	2.2 U	1.4 U	2.3 U	1.7 U	1.8 U	2.5 UJ	0.81 U
RA_HS_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	2.2 U	1.4 U	2.3 U	1.7 U	1.8 U	2.5 U	0.81 U
RA_HS_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 U	0.32 U
RA_HS_SVOCs	4-Chloroaniline	106-47-8	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 UJ	1 UJ	0.32 U
RA_HS_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	4-Nitroaniline	100-01-6	mg/kg	2.2 U	1.4 U	2.3 U	1.7 U	1.8 U	2.5 UJ	0.81 U
RA_HS_SVOCs	4-Nitrophenol	100-02-7	mg/kg	2.2 U	1.4 U	2.3 U	1.7 U	1.8 U	2.5 U	0.81 U
RA_HS_SVOCs	Acenaphthene	83-32-9	mg/kg	0.036 U	0.022 U	0.038 U	0.028 U	0.029 U	0.041 U	0.013 U
RA_HS_SVOCs	Acenaphthylene	208-96-8	mg/kg	0.036 U	0.022 U	0.038 U	0.028 U		0.041 UJ	0.013 U
RA_HS_SVOCs	Anthracene	120-12-7	mg/kg	0.036 U	0.022 U	0.038 U	0.00430 J	0.029 UJ	0.041 UJ	0.00470 J
RA_HS_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg	0.036 U	0.14	0.038 U	0.028 U	0.029 UJ	0.041 U	0.013 U
RA_HS_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg	0.036 U	0.22	0.0190 J	0.0400 J	0.029 UJ	0.0320 J	0.00550 J
RA_HS_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.0210 J	0.29	0.0350 J	0.0650	0.029 UJ	0.0650 J	0.013 U
RA_HS_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.036 U	0.14	0.038 U	0.0150 J	0.029 UJ	0.041 UJ	0.0120 J
RA_HS_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.036 U	0.0980	0.0130 J	0.0270 J	0.029 UJ	0.0230 J	0.013 U
RA_HS_SVOCs	Benzoic acid	65-85-0	mg/kg	2.2 UJ	1.4 UJ	2.3 UJ	1.7 UJ	1.8 UJ	2.5 UJ	0.81 U
RA_HS_SVOCs	Benzyl Alcohol	100-51-6	mg/kg	1.8 U	1.1 U	1.9 U	1.4 U	1.4 U	2 UJ	0.65 U
RA_HS_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.9 UJ	0.56 UJ	0.94 UJ	0.7 UJ	0.73 UJ	1 UJ	0.32 U
RA_HS_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.9 UJ	0.56 UJ	0.94 UJ	0.7 UJ	0.73 UJ	1 UJ	0.32 U
RA_HS_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Carbazole	86-74-8	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Chrysene	218-01-9	mg/kg	0.036 U	0.28	0.038 U	0.028 U	0.029 UJ	0.041 U	0.013 U
RA_HS_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.036 U	0.0380 J	0.038 U	0.028 U	0.029 UJ	0.041 UJ	0.00990 J
RA_HS_SVOCs	Dibenzofuran	132-64-9	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Diethyl Phthalate	84-66-2	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Fluoranthene	206-44-0	mg/kg	0.036 U	0.29	0.038 U	0.0670	0.029 UJ	0.041 U	0.013 U
RA_HS_SVOCs	Fluorene	86-73-7	mg/kg	0.036 U	0.0290 J	0.038 U	0.028 U	0.029 U	0.041 U	0.013 U
RA_HS_SVOCs	Hexachlorobenzene	118-74-1	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Hexachloroethane	67-72-1	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0110 J	0.14	0.0160 J	0.0370 J	0.029 UJ	0.041 UJ	0.013 U
RA_HS_SVOCs	Isophorone	78-59-1	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Naphthalene	91-20-3	mg/kg	0.036 U	0.0770	0.038 U	0.028 U	0.029 U	0.041 U	0.013 U
RA_HS_SVOCs	Nitrobenzene	98-95-3	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.9 UJ	0.56 UJ	0.94 UJ	0.7 UJ	0.73 UJ	1 UJ	0.32 U
RA_HS_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.9 U	0.56 U	0.94 U	0.7 U	0.73 U	1 UJ	0.32 U
RA_HS_SVOCs	Pentachlorophenol	87-86-5	mg/kg	2.2 U	1.4 U	2.3 U	1.7 U	1.8 U	2.5 U	0.81 U
RA_HS_SVOCs	Phenanthrene	85-01-8	mg/kg	0.00920 J	0.4	0.0140 J	0.0300 J	0.029 UJ	0.0320 J	0.00510 J
RA_HS_SVOCs	Phenol	108-95-2	mg/kg	0.9 UJ	0.56 UJ	0.94 UJ	0.7 UJ	0.73 UJ	1 U	0.32 U
RA_HS_SVOCs	Pyrene	129-00-0	mg/kg	0.036 U	0.51	0.038 U	0.0530 J	0.029 UJ	0.0380 J	0.013 U
RA_HS_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	0.16	2.1	0.21	0.37	0.29 U	0.34	0.091
RA_HS_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.26	0.65	0.28	0.060	0.20 U	0.32	0.039
RA_HS_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg	0.25	2.8	0.35	0.48	0.49 U	0.60	0.13
RA_HS_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg							
RA_HS_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg							

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-306	SSH-307	SSH-307	SSH-308	SSH-308	SSH-309	SSH-309
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SSH-306-CI19-1-2	SSH-307-CI19-0-1	SSH-307-CI19-1-2	SSH-308-CI19-0-1	SSH-308-CI19-1-2	SSH-309-CI19-0-1	SSH-309-CI19-1-2
				Sample Date	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019
				Depth Interval	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg								
RA_HS_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg								
RA_HS_VOCs	1,1-Dichloroethane	75-34-3	mg/kg								
RA_HS_VOCs	1,1-Dichloroethene	75-35-4	mg/kg								
RA_HS_VOCs	1,1-Dichloropropene	563-58-6	mg/kg								
RA_HS_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg								
RA_HS_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg								
RA_HS_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA_HS_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg								
RA_HS_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg								
RA_HS_VOCs	1,2-Dibromoethane	106-93-4	mg/kg								
RA_HS_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg								
RA_HS_VOCs	1,2-Dichloroethane	107-06-2	mg/kg								
RA_HS_VOCs	1,2-Dichloropropane	78-87-5	mg/kg								
RA_HS_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg								
RA_HS_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA_HS_VOCs	1,3-Dichloropropane	142-28-9	mg/kg								
RA_HS_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA_HS_VOCs	2,2-Dichloropropane	594-20-7	mg/kg								
RA_HS_VOCs	2-Butanone (MEK)	78-93-3	mg/kg								
RA_HS_VOCs	2-Chlorotoluene	95-49-8	mg/kg								
RA_HS_VOCs	2-Hexanone	591-78-6	mg/kg								
RA_HS_VOCs	4-Chlorotoluene	106-43-4	mg/kg								
RA_HS_VOCs	4-Isopropyltoluene	99-87-6	mg/kg								
RA_HS_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg								
RA_HS_VOCs	Acetone	67-64-1	mg/kg								
RA_HS_VOCs	Benzene	71-43-2	mg/kg								
RA_HS_VOCs	Bromobenzene	108-86-1	mg/kg								
RA_HS_VOCs	Bromochloromethane	74-97-5	mg/kg								
RA_HS_VOCs	Bromodichloromethane	75-27-4	mg/kg								
RA_HS_VOCs	Bromoform	75-25-2	mg/kg								
RA_HS_VOCs	Bromomethane	74-83-9	mg/kg								
RA_HS_VOCs	Carbon Disulfide	75-15-0	mg/kg								
RA_HS_VOCs	Carbon Tetrachloride	56-23-5	mg/kg								
RA_HS_VOCs	Chlorobenzene	108-90-7	mg/kg								
RA_HS_VOCs	Chloroethane	75-00-3	mg/kg								
RA_HS_VOCs	Chloroform	67-66-3	mg/kg								
RA_HS_VOCs	Chloromethane	74-87-3	mg/kg								
RA_HS_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg								
RA_HS_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg								
RA_HS_VOCs	dibromochloromethane	124-48-1	mg/kg								
RA_HS_VOCs	Dibromomethane	74-95-3	mg/kg								
RA_HS_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg								
RA_HS_VOCs	Ethylbenzene	100-41-4	mg/kg								
RA_HS_VOCs	Hexachlorobutadiene	87-68-3	mg/kg								
RA_HS_VOCs	Isopropylbenzene	98-82-8	mg/kg								
RA_HS_VOCs	M,P-Xylenes	179601-23-1	mg/kg								
RA_HS_VOCs	Methylene Chloride	75-09-2	mg/kg								
RA_HS_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg								
RA_HS_VOCs	Naphthalene	91-20-3	mg/kg								
RA_HS_VOCs	n-Butylbenzene	104-51-8	mg/kg								
RA_HS_VOCs	n-Propylbenzene	103-65-1	mg/kg								
RA_HS_VOCs	O-Xylene	95-47-6	mg/kg								

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-306	SSH-307	SSH-307	SSH-308	SSH-308	SSH-309	SSH-309
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SSH-306-CI19-1-2	SSH-307-CI19-0-1	SSH-307-CI19-1-2	SSH-308-CI19-0-1	SSH-308-CI19-1-2	SSH-309-CI19-0-1	SSH-309-CI19-1-2
				Sample Date	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019	10/4/2019
				Depth Interval	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_VOCs	sec-Butylbenzene	135-98-8	mg/kg								
RA_HS_VOCs	Styrene	100-42-5	mg/kg								
RA_HS_VOCs	tert-Butylbenzene	98-06-6	mg/kg								
RA_HS_VOCs	Tetrachloroethene	127-18-4	mg/kg								
RA_HS_VOCs	Toluene	108-88-3	mg/kg								
RA_HS_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg								
RA_HS_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg								
RA_HS_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg								
RA_HS_VOCs	Trichloroethylene	79-01-6	mg/kg								
RA_HS_VOCs	Trichlorofluoromethane	75-69-4	mg/kg								
RA_HS_VOCs	Vinyl Chloride	75-01-4	mg/kg								

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-310	SSH-310	SSH-4	SSH-4	SSH-5	SSH-5	SSH-6
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SSH-310-CI19-0-1	SSH-310-CI19-1-2	SSH-4A 0-1	SSH-4A 1-2	SSH-5A 0-1	SSH-5A 1-2	SSH-6A 0-1
				Sample Date	10/4/2019	10/4/2019	11/29/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_Metals	Aluminum	7429-90-5	mg/kg	4800	5700						
RA_HS_Metals	Antimony	7440-36-0	mg/kg	0.0990 J	0.120 J						
RA_HS_Metals	Arsenic	7440-38-2	mg/kg	2.37	7.20	7.6 J	6.6 J	10.5	5 J	6.5 J	
RA_HS_Metals	Barium	7440-39-3	mg/kg	7.16	8.82	9.9 J	8.9 J	11.5	7 J	18	
RA_HS_Metals	Beryllium	7440-41-7	mg/kg	0.434	0.438						
RA_HS_Metals	Cadmium	7440-43-9	mg/kg	0.0660 J	0.0690 J	0.3 J	1 J	0.4 J	1.6 U	1.6 U	
RA_HS_Metals	Calcium	7440-70-2	mg/kg	1410	1820						
RA_HS_Metals	Chromium	7440-47-3	mg/kg	10.1	10.8	18.9	16	21.3	9.9	29	
RA_HS_Metals	Cobalt	7440-48-4	mg/kg	1.54	2.27						
RA_HS_Metals	Copper	7440-50-8	mg/kg	10.8	5.14						
RA_HS_Metals	Iron	7439-89-6	mg/kg	5050	7190						
RA_HS_Metals	Lead	7439-92-1	mg/kg	23.5	12.4	93.1	81.4	158	33.6	175	
RA_HS_Metals	Magnesium	7439-95-4	mg/kg	2150	3920						
RA_HS_Metals	Manganese	7439-96-5	mg/kg	64.9	60.9						
RA_HS_Metals	Mercury	7439-97-6	mg/kg	0.0760	0.041 U	0.07 J	0.173 U	0.12 J	0.119 U	0.124	
RA_HS_Metals	Nickel	7440-02-0	mg/kg	5.18	7.35						
RA_HS_Metals	Potassium	7440-09-7	mg/kg	1040	1590						
RA_HS_Metals	Selenium	7782-49-2	mg/kg	0.190 J	0.300 J	3.6 J	4.6 J	3.5 J	16.3 U	4.9 J	
RA_HS_Metals	Silver	7440-22-4	mg/kg	0.115 J	0.0310 J	2.4 U	3 U	1.9 U	1.6 U	1.6 U	
RA_HS_Metals	Sodium	7440-23-5	mg/kg	6600	16200						
RA_HS_Metals	Thallium	7440-28-0	mg/kg	0.054 U	0.1 U						
RA_HS_Metals	Vanadium	7440-62-2	mg/kg	13.8	20.7						
RA_HS_Metals	Zinc	7440-66-6	mg/kg	24.5	23.1						
RA_HS_Other	Total Organic Carbon	TOC	mg/kg			239000	175000	188000	264000	156000	
RA_HS_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.015 U	0.022 U	0.265 U	0.298 U	0.231 U	0.215 U	0.166 U	
RA_HS_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.015 U	0.022 U	0.265 U	0.298 U	0.231 U	0.215 U	0.166 U	
RA_HS_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.018 U	0.026 U	0.265 U	0.298 U	0.231 U	0.215 U	0.166 U	
RA_HS_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.015 U	0.022 U	0.265 U	0.298 U	0.231 U	0.215 U	0.166 U	
RA_HS_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.015 U	0.022 U	0.265 U	0.298 U	0.231 U	0.215 U	0.166 U	
RA_HS_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.015 U	0.022 U	0.265 U	0.298 U	0.231 U	0.215 U	0.166 U	
RA_HS_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.0390	0.022 U	0.134 J	0.298 U	0.231 U	0.215 U	0.241	
RA_HS_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg			0.265 U	0.298 U	0.231 U	0.215 U	0.166 U	
RA_HS_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg			0.265 U	0.298 U	0.231 U	0.215 U	0.166 U	
RA_HS_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.0390 J	0.16 U						
RA_HS_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.13	0.16 U	2.3	2.7 U	2.1 U	1.9 U	1.6	
RA_HS_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg	0.00640 J	0.03 U						
RA_HS_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg	1.1 U	1.8 U						
RA_HS_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg	1.1 U	1.8 U						
RA_HS_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	2-Chlorophenol	95-57-8	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg	0.00680 J	0.03 U						
RA_HS_SVOCs	2-Methylphenol	95-48-7	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	2-Nitroaniline	88-74-4	mg/kg	1.1 U	1.8 U						
RA_HS_SVOCs	2-Nitrophenol	88-75-5	mg/kg	0.44 U	0.74 U						

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-310	SSH-310	SSH-4	SSH-4	SSH-5	SSH-5	SSH-6
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SSH-310-CI19-0-1	SSH-310-CI19-1-2	SSH-4A 0-1	SSH-4A 1-2	SSH-5A 0-1	SSH-5A 1-2	SSH-6A 0-1
				Sample Date	10/4/2019	10/4/2019	11/29/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	3-Nitroaniline	99-09-2	mg/kg	1.1 U	1.8 U						
RA_HS_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	1.1 U	1.8 U						
RA_HS_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	4-Chloroaniline	106-47-8	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	4-Nitroaniline	100-01-6	mg/kg	1.1 U	1.8 U						
RA_HS_SVOCs	4-Nitrophenol	100-02-7	mg/kg	1.1 U	1.8 U						
RA_HS_SVOCs	Acenaphthene	83-32-9	mg/kg	0.0130 J	0.03 U						
RA_HS_SVOCs	Acenaphthylene	208-96-8	mg/kg	0.018 U	0.03 U						
RA_HS_SVOCs	Anthracene	120-12-7	mg/kg	0.0270 J	0.03 UJ						
RA_HS_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg	0.0930	0.03 U						
RA_HS_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg	0.0960	0.0130 J						
RA_HS_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.13	0.0170 J						
RA_HS_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.0530	0.00770 J						
RA_HS_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.0530	0.0110 J						
RA_HS_SVOCs	Benzoic acid	65-85-0	mg/kg	1.1 U	1.8 U						
RA_HS_SVOCs	Benzyl Alcohol	100-51-6	mg/kg	0.87 U	1.5 U						
RA_HS_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Carbazole	86-74-8	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Chrysene	218-01-9	mg/kg	0.11	0.03 U						
RA_HS_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.0180 J	0.00620 J						
RA_HS_SVOCs	Dibenzofuran	132-64-9	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Diethyl Phthalate	84-66-2	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Fluoranthene	206-44-0	mg/kg	0.2	0.03 U						
RA_HS_SVOCs	Fluorene	86-73-7	mg/kg	0.0160 J	0.03 U						
RA_HS_SVOCs	Hexachlorobenzene	118-74-1	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Hexachloroethane	67-72-1	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0710	0.03 U						
RA_HS_SVOCs	Isophorone	78-59-1	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Naphthalene	91-20-3	mg/kg	0.0110 J	0.03 U						
RA_HS_SVOCs	Nitrobenzene	98-95-3	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Pentachlorophenol	87-86-5	mg/kg	1.1 U	1.8 U						
RA_HS_SVOCs	Phenanthrene	85-01-8	mg/kg	0.16	0.03 U						
RA_HS_SVOCs	Phenol	108-95-2	mg/kg	0.44 U	0.74 U						
RA_HS_SVOCs	Pyrene	129-00-0	mg/kg	0.24	0.03 U						
RA_HS_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	1.1	0.11						
RA_HS_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.25	0.24 U						
RA_HS_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg	1.3	0.20						
RA_HS_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U	
RA_HS_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U	

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-310	SSH-310	SSH-4	SSH-4	SSH-5	SSH-5	SSH-6
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SSH-310-CI19-0-1	SSH-310-CI19-1-2	SSH-4A 0-1	SSH-4A 1-2	SSH-5A 0-1	SSH-5A 1-2	SSH-6A 0-1
				Sample Date	10/4/2019	10/4/2019	11/29/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,1-Dichloroethane	75-34-3	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,1-Dichloroethene	75-35-4	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,1-Dichloropropene	563-58-6	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,2-Dibromoethane	106-93-4	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,2-Dichloroethane	107-06-2	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,2-Dichloropropane	78-87-5	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,3-Dichloropropane	142-28-9	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	2,2-Dichloropropane	594-20-7	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	2-Butanone (MEK)	78-93-3	mg/kg			0.242 U	0.0162 J	0.0173 J	0.0146 J	0.0925 J
RA_HS_VOCs	2-Chlorotoluene	95-49-8	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	2-Hexanone	591-78-6	mg/kg			0.242 U	0.205 U	0.162 U	0.145 U	0.694 U
RA_HS_VOCs	4-Chlorotoluene	106-43-4	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	4-Isopropyltoluene	99-87-6	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg			0.242 U	0.205 U	0.162 U	0.145 U	0.694 U
RA_HS_VOCs	Acetone	67-64-1	mg/kg			0.733	0.233	0.676	0.13 J	4.29
RA_HS_VOCs	Benzene	71-43-2	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Bromobenzene	108-86-1	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Bromochloromethane	74-97-5	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Bromodichloromethane	75-27-4	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Bromoform	75-25-2	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Bromomethane	74-83-9	mg/kg			0.0484 U	0.041 U	0.0324 U	0.0289 U	0.139 U
RA_HS_VOCs	Carbon Disulfide	75-15-0	mg/kg			0.0242 U	0.0147 J	0.0086 J	0.0124 J	0.0694 U
RA_HS_VOCs	Carbon Tetrachloride	56-23-5	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Chlorobenzene	108-90-7	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Chloroethane	75-00-3	mg/kg			0.0484 U	0.041 U	0.0324 U	0.0289 U	0.139 U
RA_HS_VOCs	Chloroform	67-66-3	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Chloromethane	74-87-3	mg/kg			0.0484 U	0.041 U	0.0324 U	0.0289 U	0.139 U
RA_HS_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	dibromochloromethane	124-48-1	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Dibromomethane	74-95-3	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg			0.0484 U	0.041 U	0.0324 U	0.0289 U	0.139 U
RA_HS_VOCs	Ethylbenzene	100-41-4	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Hexachlorobutadiene	87-68-3	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Isopropylbenzene	98-82-8	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	M,P-Xylenes	179601-23-1	mg/kg			0.0484 U	0.041 U	0.0324 U	0.0289 U	0.139 U
RA_HS_VOCs	Methylene Chloride	75-09-2	mg/kg			0.121 U	0.102 U	0.0809 U	0.0723 U	0.347 U
RA_HS_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Naphthalene	91-20-3	mg/kg			24.2 U	20.5 U	16.2 U	14.5 U	69.4 U
RA_HS_VOCs	n-Butylbenzene	104-51-8	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	n-Propylbenzene	103-65-1	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	O-Xylene	95-47-6	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SSH-310	SSH-310	SSH-4	SSH-4	SSH-5	SSH-5	SSH-6
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SSH-310-CI19-0-1	SSH-310-CI19-1-2	SSH-4A 0-1	SSH-4A 1-2	SSH-5A 0-1	SSH-5A 1-2	SSH-6A 0-1
				Sample Date	10/4/2019	10/4/2019	11/29/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011
				Depth Interval	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_HS_VOCs	sec-Butylbenzene	135-98-8	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Styrene	100-42-5	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	tert-Butylbenzene	98-06-6	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Tetrachloroethene	127-18-4	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Toluene	108-88-3	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0719
RA_HS_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg			0.073 U	0.062 U	0.049 U	0.043 U	0.21 U
RA_HS_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Trichloroethylene	79-01-6	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Trichlorofluoromethane	75-69-4	mg/kg			0.0242 U	0.0205 U	0.0162 U	0.0145 U	0.0694 U
RA_HS_VOCs	Vinyl Chloride	75-01-4	mg/kg			0.0484 U	0.041 U	0.0324 U	0.0289 U	0.139 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SSH-6
			Sample Type Code	N
			Sample ID	SSH-6A 1-2
			Sample Date	11/29/2011
			Depth Interval	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units	
RA_HS_Metals	Aluminum	7429-90-5	mg/kg	
RA_HS_Metals	Antimony	7440-36-0	mg/kg	
RA_HS_Metals	Arsenic	7440-38-2	mg/kg	8 J
RA_HS_Metals	Barium	7440-39-3	mg/kg	17.8
RA_HS_Metals	Beryllium	7440-41-7	mg/kg	
RA_HS_Metals	Cadmium	7440-43-9	mg/kg	2.2 U
RA_HS_Metals	Calcium	7440-70-2	mg/kg	
RA_HS_Metals	Chromium	7440-47-3	mg/kg	29
RA_HS_Metals	Cobalt	7440-48-4	mg/kg	
RA_HS_Metals	Copper	7440-50-8	mg/kg	
RA_HS_Metals	Iron	7439-89-6	mg/kg	
RA_HS_Metals	Lead	7439-92-1	mg/kg	109
RA_HS_Metals	Magnesium	7439-95-4	mg/kg	
RA_HS_Metals	Manganese	7439-96-5	mg/kg	
RA_HS_Metals	Mercury	7439-97-6	mg/kg	0.13
RA_HS_Metals	Nickel	7440-02-0	mg/kg	
RA_HS_Metals	Potassium	7440-09-7	mg/kg	
RA_HS_Metals	Selenium	7782-49-2	mg/kg	4.3 J
RA_HS_Metals	Silver	7440-22-4	mg/kg	2.2 U
RA_HS_Metals	Sodium	7440-23-5	mg/kg	
RA_HS_Metals	Thallium	7440-28-0	mg/kg	
RA_HS_Metals	Vanadium	7440-62-2	mg/kg	
RA_HS_Metals	Zinc	7440-66-6	mg/kg	
RA_HS_Other	Total Organic Carbon	TOC	mg/kg	224000
RA_HS_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.262 U
RA_HS_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.262 U
RA_HS_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.262 U
RA_HS_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.262 U
RA_HS_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.262 U
RA_HS_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.262 U
RA_HS_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.0977 J
RA_HS_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg	0.262 U
RA_HS_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg	0.262 U
RA_HS_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg	
RA_HS_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	2.2
RA_HS_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	
RA_HS_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	
RA_HS_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	
RA_HS_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	
RA_HS_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg	
RA_HS_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg	
RA_HS_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg	
RA_HS_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg	
RA_HS_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg	
RA_HS_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg	
RA_HS_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg	
RA_HS_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg	
RA_HS_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg	
RA_HS_SVOCs	2-Chlorophenol	95-57-8	mg/kg	
RA_HS_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg	
RA_HS_SVOCs	2-Methylphenol	95-48-7	mg/kg	
RA_HS_SVOCs	2-Nitroaniline	88-74-4	mg/kg	
RA_HS_SVOCs	2-Nitrophenol	88-75-5	mg/kg	

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

		Location Group		Off-Project Red Maple Swamp / Tidal Stream Area
		Location ID		SSH-6
		Sample Type Code		N
		Sample ID		SSH-6A 1-2
		Sample Date		11/29/2011
		Depth Interval		1 - 2 ft
Method Analyte Group	Compound	CAS #	Units	
RA_HS_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg	
RA_HS_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	
RA_HS_SVOCs	3-Nitroaniline	99-09-2	mg/kg	
RA_HS_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	
RA_HS_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	
RA_HS_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	
RA_HS_SVOCs	4-Chloroaniline	106-47-8	mg/kg	
RA_HS_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	
RA_HS_SVOCs	4-Nitroaniline	100-01-6	mg/kg	
RA_HS_SVOCs	4-Nitrophenol	100-02-7	mg/kg	
RA_HS_SVOCs	Acenaphthene	83-32-9	mg/kg	
RA_HS_SVOCs	Acenaphthylene	208-96-8	mg/kg	
RA_HS_SVOCs	Anthracene	120-12-7	mg/kg	
RA_HS_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg	
RA_HS_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg	
RA_HS_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg	
RA_HS_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	
RA_HS_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg	
RA_HS_SVOCs	Benzoic acid	65-85-0	mg/kg	
RA_HS_SVOCs	Benzyl Alcohol	100-51-6	mg/kg	
RA_HS_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	
RA_HS_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	
RA_HS_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	
RA_HS_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	
RA_HS_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg	
RA_HS_SVOCs	Carbazole	86-74-8	mg/kg	
RA_HS_SVOCs	Chrysene	218-01-9	mg/kg	
RA_HS_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	
RA_HS_SVOCs	Dibenzofuran	132-64-9	mg/kg	
RA_HS_SVOCs	Diethyl Phthalate	84-66-2	mg/kg	
RA_HS_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg	
RA_HS_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg	
RA_HS_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg	
RA_HS_SVOCs	Fluoranthene	206-44-0	mg/kg	
RA_HS_SVOCs	Fluorene	86-73-7	mg/kg	
RA_HS_SVOCs	Hexachlorobenzene	118-74-1	mg/kg	
RA_HS_SVOCs	Hexachloroethane	67-72-1	mg/kg	
RA_HS_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	
RA_HS_SVOCs	Isophorone	78-59-1	mg/kg	
RA_HS_SVOCs	Naphthalene	91-20-3	mg/kg	
RA_HS_SVOCs	Nitrobenzene	98-95-3	mg/kg	
RA_HS_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	
RA_HS_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	
RA_HS_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	
RA_HS_SVOCs	Pentachlorophenol	87-86-5	mg/kg	
RA_HS_SVOCs	Phenanthrene	85-01-8	mg/kg	
RA_HS_SVOCs	Phenol	108-95-2	mg/kg	
RA_HS_SVOCs	Pyrene	129-00-0	mg/kg	
RA_HS_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	
RA_HS_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	
RA_HS_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg	
RA_HS_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0181 U
RA_HS_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0181 U

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

		Location Group		Off-Project Red Maple Swamp / Tidal Stream Area
		Location ID		SSH-6
		Sample Type Code		N
		Sample ID		SSH-6A 1-2
		Sample Date		11/29/2011
		Depth Interval		1 - 2 ft
Method Analyte Group	Compound	CAS #	Units	
RA_HS_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0181 U
RA_HS_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0181 U
RA_HS_VOCs	1,1-Dichloroethane	75-34-3	mg/kg	0.0181 U
RA_HS_VOCs	1,1-Dichloroethene	75-35-4	mg/kg	0.0181 U
RA_HS_VOCs	1,1-Dichloropropene	563-58-6	mg/kg	0.0181 U
RA_HS_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0181 U
RA_HS_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0181 U
RA_HS_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0181 U
RA_HS_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0181 U
RA_HS_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0181 U
RA_HS_VOCs	1,2-Dibromoethane	106-93-4	mg/kg	0.0181 U
RA_HS_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0181 U
RA_HS_VOCs	1,2-Dichloroethane	107-06-2	mg/kg	0.0181 U
RA_HS_VOCs	1,2-Dichloropropane	78-87-5	mg/kg	0.0181 U
RA_HS_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0181 U
RA_HS_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0181 U
RA_HS_VOCs	1,3-Dichloropropane	142-28-9	mg/kg	0.0181 U
RA_HS_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0181 U
RA_HS_VOCs	2,2-Dichloropropane	594-20-7	mg/kg	0.0181 U
RA_HS_VOCs	2-Butanone (MEK)	78-93-3	mg/kg	0.0689 J
RA_HS_VOCs	2-Chlorotoluene	95-49-8	mg/kg	0.0181 U
RA_HS_VOCs	2-Hexanone	591-78-6	mg/kg	0.181 U
RA_HS_VOCs	4-Chlorotoluene	106-43-4	mg/kg	0.0181 U
RA_HS_VOCs	4-Isopropyltoluene	99-87-6	mg/kg	0.0181 U
RA_HS_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.181 U
RA_HS_VOCs	Acetone	67-64-1	mg/kg	0.187
RA_HS_VOCs	Benzene	71-43-2	mg/kg	0.0181 U
RA_HS_VOCs	Bromobenzene	108-86-1	mg/kg	0.0181 U
RA_HS_VOCs	Bromochloromethane	74-97-5	mg/kg	0.0181 U
RA_HS_VOCs	Bromodichloromethane	75-27-4	mg/kg	0.0181 U
RA_HS_VOCs	Bromoform	75-25-2	mg/kg	0.0181 U
RA_HS_VOCs	Bromomethane	74-83-9	mg/kg	0.0363 U
RA_HS_VOCs	Carbon Disulfide	75-15-0	mg/kg	0.0181 U
RA_HS_VOCs	Carbon Tetrachloride	56-23-5	mg/kg	0.0181 U
RA_HS_VOCs	Chlorobenzene	108-90-7	mg/kg	0.0181 U
RA_HS_VOCs	Chloroethane	75-00-3	mg/kg	0.0363 U
RA_HS_VOCs	Chloroform	67-66-3	mg/kg	0.0181 U
RA_HS_VOCs	Chloromethane	74-87-3	mg/kg	0.0363 U
RA_HS_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0181 U
RA_HS_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0181 U
RA_HS_VOCs	dibromochloromethane	124-48-1	mg/kg	0.0181 U
RA_HS_VOCs	Dibromomethane	74-95-3	mg/kg	0.0181 U
RA_HS_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0363 U
RA_HS_VOCs	Ethylbenzene	100-41-4	mg/kg	0.0181 U
RA_HS_VOCs	Hexachlorobutadiene	87-68-3	mg/kg	0.0181 U
RA_HS_VOCs	Isopropylbenzene	98-82-8	mg/kg	0.0181 U
RA_HS_VOCs	M,P-Xylenes	179601-23-1	mg/kg	0.0363 U
RA_HS_VOCs	Methylene Chloride	75-09-2	mg/kg	0.0907 U
RA_HS_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0181 U
RA_HS_VOCs	Naphthalene	91-20-3	mg/kg	18.1 U
RA_HS_VOCs	n-Butylbenzene	104-51-8	mg/kg	0.0181 U
RA_HS_VOCs	n-Propylbenzene	103-65-1	mg/kg	0.0181 U
RA_HS_VOCs	O-Xylene	95-47-6	mg/kg	0.0181 U

ATTACHMENT A, TABLE A-2B
HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SSH-6
			Sample Type Code	N
			Sample ID	SSH-6A 1-2
			Sample Date	11/29/2011
			Depth Interval	1 - 2 ft
Method Analyte Group	Compound	CAS #	Units	
RA_HS_VOCs	sec-Butylbenzene	135-98-8	mg/kg	0.0181 U
RA_HS_VOCs	Styrene	100-42-5	mg/kg	0.0181 U
RA_HS_VOCs	tert-Butylbenzene	98-06-6	mg/kg	0.0181 U
RA_HS_VOCs	Tetrachloroethene	127-18-4	mg/kg	0.0181 U
RA_HS_VOCs	Toluene	108-88-3	mg/kg	0.0118 J
RA_HS_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.054 U
RA_HS_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0181 U
RA_HS_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0181 U
RA_HS_VOCs	Trichloroethylene	79-01-6	mg/kg	0.0181 U
RA_HS_VOCs	Trichlorofluoromethane	75-69-4	mg/kg	0.0181 U
RA_HS_VOCs	Vinyl Chloride	75-01-4	mg/kg	0.0363 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-2C
BACKGROUND HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background
				Location ID	SSH-311	SSH-311	SSH-311	SSH-312	SSH-312	SSH-313	SSH-313	SSH-314
				Depth Interval	0 - 1 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
				Sample Type Code	N	FD	N	N	N	N	N	N
				Sample ID	SSH-311-CI20-0-1	SSH-311-CI20-0-1-DUP	SSH-311-CI20-1-2	SSH-312-CI20-0-1	SSH-312-CI20-1-2	SSH-313-CI20-0-1	SSH-313-CI20-1-2	SSH-314-CI20-0-1
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units									
RA_HS_Metals	Aluminum	7429-90-5	mg/kg		11000	9890	7540	4110	8510	8100	5950	
RA_HS_Metals	Antimony	7440-36-0	mg/kg	0.055 U	0.130	0.067 U	0.062 U	0.055 U	0.583	0.779	0.13 U	
RA_HS_Metals	Arsenic	7440-38-2	mg/kg		3.55	3.55	2.54	1.10	9.27	12.5	1.80	
RA_HS_Metals	Barium	7440-39-3	mg/kg		11.4	10.4	7.90	36.8	9.06	9.21	6.75	
RA_HS_Metals	Beryllium	7440-41-7	mg/kg		0.750	0.703	0.534	0.307	0.608	0.592	0.518	
RA_HS_Metals	Cadmium	7440-43-9	mg/kg	0.022 U	0.026 U	0.027 U	0.025 U	0.022 U	0.022 U	0.023 U	0.052 U	
RA_HS_Metals	Calcium	7440-70-2	mg/kg		902	783	612	320	809	668	1590	
RA_HS_Metals	Chromium	7440-47-3	mg/kg	10.6	12.3	11.1	9.22	5.20	20.2	22.9	8.38	
RA_HS_Metals	Cobalt	7440-48-4	mg/kg	2.66	2.68	2.55	2.22	1.62	4.46	5.00	1.79	
RA_HS_Metals	Copper	7440-50-8	mg/kg	6.75	8.16	17.0	5.43	2.73	40.0	50.8	8.45	
RA_HS_Metals	Iron	7439-89-6	mg/kg	10500	11600	10700	8740	6400	52000	62900	5950	
RA_HS_Metals	Lead	7439-92-1	mg/kg	34.6	42.5	42.4	25.1	4.86	23.0	21.0	38.3	
RA_HS_Metals	Magnesium	7439-95-4	mg/kg	2060	2350	2120	1890	1450	1790	1780	1510	
RA_HS_Metals	Manganese	7439-96-5	mg/kg	81.7	89.1	83.0	70.3	54.4	176	200	62.1	
RA_HS_Metals	Mercury	7439-97-6	mg/kg	0.0480 J	0.0530	0.0490	0.0470	0.0150 J	0.0560	0.0620	0.0830	
RA_HS_Metals	Nickel	7440-02-0	mg/kg	6.66	7.55	6.82	5.59	3.91	15.5	17.2	4.44	
RA_HS_Metals	Potassium	7440-09-7	mg/kg	896	969	938	753	630	751	1000	605	
RA_HS_Metals	Selenium	7782-49-2	mg/kg	0.300 J	0.360 J	0.320 J	0.220 J	0.0750 J	0.260 J	0.240 J	0.330 J	
RA_HS_Metals	Silver	7440-22-4	mg/kg		0.0530 J	0.0480 J	0.0320 J	0.00770 J	0.0330 J	0.0320 J	0.0620 J	
RA_HS_Metals	Sodium	7440-23-5	mg/kg	44 U	52 U	54 U	50 U	44 U	45 U	46 U	100 U	
RA_HS_Metals	Thallium	7440-28-0	mg/kg	0.133	0.162	0.132	0.05 U	0.044 U	0.117	0.128	0.1 U	
RA_HS_Metals	Vanadium	7440-62-2	mg/kg	18.5	21.7	20.1	15.5	7.48	16.7	16.6	13.2	
RA_HS_Metals	Zinc	7440-66-6	mg/kg	29.2	33.2	31.8	25.0	18.0	28.0	35.5	29.3	
RA_HS_Other	Total Organic Carbon	TOC	mg/kg	25000 J	43000 J	41000 J			40000 J	26000 J		
RA_HS_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.012 U	0.012 U	0.012 U	0.01 U	0.011 U	0.011 U	0.011 U	0.023 U	
RA_HS_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.012 U	0.012 U	0.012 U	0.01 U	0.011 U	0.011 U	0.011 U	0.023 U	
RA_HS_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.014 U	0.014 U	0.014 U	0.012 U	0.013 U	0.013 U	0.013 U	0.027 U	
RA_HS_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.012 U	0.012 U	0.012 U	0.01 U	0.011 U	0.011 U	0.011 U	0.023 U	
RA_HS_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.012 U	0.012 U	0.012 U	0.01 U	0.011 U	0.011 U	0.011 U	0.023 U	
RA_HS_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.012 U	0.012 U	0.012 U	0.01 U	0.011 U	0.011 U	0.011 U	0.023 U	
RA_HS_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.012 U	0.012 U	0.012 U	0.01 U	0.011 U	0.011 U	0.011 U	0.023 U	
RA_HS_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.084 U	0.087 U	0.088 U	0.075 U	0.077 U	0.079 U	0.081 U	0.16 U	
RA_HS_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.086 U	0.086 U	0.086 U	0.072 U	0.079 U	0.079 U	0.079 U	0.17 U	
RA_HS_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg	0.013 U	0.014 U	0.015 U	0.014 U	0.013 U	0.015 U	0.013 U	0.028 U	
RA_HS_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg	0.013 U	0.014 U	0.015 U	0.014 U	0.013 U	0.015 U	0.013 U	0.028 U	
RA_HS_SVOCs	Acenaphthene	83-32-9	mg/kg		0.014 U	0.015 U	0.014 U	0.013 U	0.015 U	0.013 U	0.028 U	
RA_HS_SVOCs	Acenaphthylene	208-96-8	mg/kg		0.014 U	0.015 U	0.014 U	0.013 U	0.015 U	0.013 U	0.028 U	
RA_HS_SVOCs	Anthracene	120-12-7	mg/kg		0.00210 J	0.00210 J	0.00220 J	0.013 U	0.00240 J	0.00210 J	0.0150 J	
RA_HS_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg		0.0120 J	0.0130 J	0.0180 J	0.013 UJ	0.0160 J	0.0110 J	0.11	
RA_HS_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg		0.0180 J	0.0180 J	0.0210 J	0.013 U	0.0190 J	0.0140 J	0.13	
RA_HS_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg		0.0280 J	0.0280 J	0.0450	0.013 U	0.0330	0.0200 J	0.4	
RA_HS_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg		0.0160 J	0.0180 J	0.0190 J	0.013 U	0.0190 J	0.0130 J	0.14	
RA_HS_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg		0.0110 J	0.0120 J	0.0160 J	0.013 U	0.0130 J	0.00910 J	0.14	
RA_HS_SVOCs	Chrysene	218-01-9	mg/kg	0.0330	0.0220 J	0.0220 J	0.0320	0.013 U	0.0320	0.0150 J	0.38	
RA_HS_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.00390 J	0.014 U	0.015 U	0.00560 J	0.013 U	0.015 U	0.00310 J	0.0320 J	
RA_HS_SVOCs	Fluoranthene	206-44-0	mg/kg	0.0630	0.0420	0.0390	0.0440	0.013 U	0.0370	0.0280	0.53	
RA_HS_SVOCs	Fluorene	86-73-7	mg/kg	0.013 U	0.014 U	0.015 U	0.014 U	0.013 U	0.015 U	0.013 U	0.028 U	
RA_HS_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0160 J	0.0130 J	0.0150 J	0.0170 J	0.013 U	0.0150 J	0.0100 J	0.12	
RA_HS_SVOCs	Naphthalene	91-20-3	mg/kg	0.00480 J	0.014 U	0.015 U	0.014 U	0.013 U	0.00410 J	0.013 U	0.00800 J	
RA_HS_SVOCs	Phenanthrene	85-01-8	mg/kg	0.0240 J	0.0180 J	0.0180 J	0.0170 J	0.013 U	0.0190 J	0.0160 J	0.16	
RA_HS_SVOCs	Pyrene	129-00-0	mg/kg	0.0630	0.0410	0.0410	0.0410	0.013 U	0.0490	0.0310	0.54	
RA_HS_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	0.18	0.22	0.22	0.26	0.13 U	0.25	0.15	2.5	
RA_HS_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.043	0.033	0.033	0.033	0.10 U	0.042	0.030	0.24	
RA_HS_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg	0.22	0.29	0.29	0.30	0.23 U	0.30	0.21	2.8	

ATTACHMENT A, TABLE A-2C
BACKGROUND HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background
				Location ID	SSH-311	SSH-311	SSH-311	SSH-312	SSH-312	SSH-313	SSH-313	SSH-314
				Depth Interval	0 - 1 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
				Sample Type Code	N	FD	N	N	N	N	N	N
				Sample ID	SSH-311-CI20-0-1	SSH-311-CI20-0-1-DUP	SSH-311-CI20-1-2	SSH-312-CI20-0-1	SSH-312-CI20-1-2	SSH-313-CI20-0-1	SSH-313-CI20-1-2	SSH-314-CI20-0-1
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units									

Notes:
B = Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
HS = Hydric soil.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-2C
BACKGROUND HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background
				Location ID	SSH-314	SSH-315	SSH-315	SSH-316	SSH-316	SSH-317	SSH-317	SSH-318
				Depth Interval	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
				Sample Type Code	N	N	N	N	N	N	N	N
				Sample ID	SSH-314-CI20-1-2	SSH-315-CI20-0-1	SSH-315-CI20-1-2	SSH-316-CI20-0-1	SSH-316-CI20-1-2	SSH-317-CI20-0-1	SSH-317-CI20-1-2	SSH-318-CI20-0-1
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units									
RA HS Metals	Aluminum	7429-90-5	mg/kg	10800	6720	5440	5510	3210	5280	5370	3880
RA HS Metals	Antimony	7440-36-0	mg/kg	0.1 U	0.1 U	0.088 U	0.08 UJ	0.041 U	0.06 U	0.063 U	0.073 U
RA HS Metals	Arsenic	7440-38-2	mg/kg	3.00	2.00	1.70	1.70	0.660	1.60	1.50	1.00
RA HS Metals	Barium	7440-39-3	mg/kg	12.7	7.72	6.26	5.57	5.37	5.69	6.70	4.68
RA HS Metals	Beryllium	7440-41-7	mg/kg	0.756	0.539	0.406	0.427	0.247	0.416	0.428	0.309
RA HS Metals	Cadmium	7440-43-9	mg/kg	0.042 U	0.041 U	0.035 U	0.032 U	0.016 U	0.024 U	0.025 U	0.029 U
RA HS Metals	Calcium	7440-70-2	mg/kg	1470	1140	986	626 J	448	696	577	500
RA HS Metals	Chromium	7440-47-3	mg/kg	12.2	8.93	7.58	7.50	4.80	8.04	7.21	5.30
RA HS Metals	Cobalt	7440-48-4	mg/kg	2.51	1.91	1.60	1.94	1.45	1.75	1.71	1.34
RA HS Metals	Copper	7440-50-8	mg/kg	9.24	6.40	6.94	5.22	1.78	4.06	3.71	3.58
RA HS Metals	Iron	7439-89-6	mg/kg	8920	6950	5220	7240	4680	6550	6090	4740
RA HS Metals	Lead	7439-92-1	mg/kg	51.8	31.7	31.8	34.3 J	8.46	31.1	96.2	36.4
RA HS Metals	Magnesium	7439-95-4	mg/kg	2060	1680	1370	1700 J	1210	1590	1440	1170
RA HS Metals	Manganese	7439-96-5	mg/kg	95.4	75.4	57.9	74.0 J	64.4	72.8	74.6	55.6
RA HS Metals	Mercury	7439-97-6	mg/kg	0.0560 J	0.0320 J	0.0300 J	0.0370 J	0.00910 J	0.0330 J	0.0170 J	0.0260 J
RA HS Metals	Nickel	7440-02-0	mg/kg	7.26	5.34	4.62	5.14	3.26	4.63	4.32	3.33
RA HS Metals	Potassium	7440-09-7	mg/kg	866	683	564	585 J	506	539	616	451
RA HS Metals	Selenium	7782-49-2	mg/kg	0.340 J	0.240 J	0.220 J	0.170 J	0.0550 J	0.150 J	0.150 J	0.130 J
RA HS Metals	Silver	7440-22-4	mg/kg	0.0600 J	0.0430 J	0.0440 J	0.0270 J	0.00970 J	0.0280 J	0.0260 J	0.0220 J
RA HS Metals	Sodium	7440-23-5	mg/kg	84 U	82 U	70 U	64 U	32 U	48 U	50 U	58 U
RA HS Metals	Thallium	7440-28-0	mg/kg	0.084 U	0.082 U	0.07 U	0.064 U	0.032 U	0.048 U	0.05 U	0.058 U
RA HS Metals	Vanadium	7440-62-2	mg/kg	24.0	16.4	12.6	13.1	6.38	12.1	9.64	8.14
RA HS Metals	Zinc	7440-66-6	mg/kg	40.7	31.0	25.0	25.1	15.2	21.8	20.7	17.9
RA HS Other	Total Organic Carbon	TOC	mg/kg				42000 J	11000 J			18000 J
RA HS Pest PCBs	Aroclor 1016	12674-11-2	mg/kg	0.018 U	0.016 U	0.015 UJ	0.012 U	0.009 U	0.011 U	0.011 U	0.013 U
RA HS Pest PCBs	Aroclor 1221	11104-28-2	mg/kg	0.018 U	0.016 U	0.015 UJ	0.012 U	0.009 U	0.011 U	0.011 U	0.013 U
RA HS Pest PCBs	Aroclor 1232	11141-16-5	mg/kg	0.021 U	0.019 U	0.017 UJ	0.014 U	0.011 U	0.013 U	0.013 U	0.015 U
RA HS Pest PCBs	Aroclor 1242	53469-21-9	mg/kg	0.018 U	0.016 U	0.015 UJ	0.012 U	0.009 U	0.011 U	0.011 U	0.013 U
RA HS Pest PCBs	Aroclor 1248	12672-29-6	mg/kg	0.018 U	0.016 U	0.015 UJ	0.012 U	0.009 U	0.011 U	0.011 U	0.013 U
RA HS Pest PCBs	Aroclor 1254	11097-69-1	mg/kg	0.018 U	0.016 U	0.015 UJ	0.012 U	0.009 U	0.011 U	0.011 U	0.013 U
RA HS Pest PCBs	Aroclor 1260	11096-82-5	mg/kg	0.018 U	0.016 U	0.015 UJ	0.012 U	0.009 U	0.011 U	0.011 U	0.013 U
RA HS Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.13 U	0.12 U	0.11 UJ	0.088 U	0.065 U	0.08 U	0.082 U	0.092 U
RA HS Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.13 U	0.12 U	0.11 U	0.086 U	0.065 U	0.079 U	0.079 U	0.093 U
RA HS SVOCs	1-Methylnaphthalene	90-12-0	mg/kg	0.022 U	0.00400 J	0.02 U	0.017 U	0.012 U	0.014 U	0.015 U	0.015 U
RA HS SVOCs	2-Methylnaphthalene	91-57-6	mg/kg	0.022 U	0.00480 J	0.02 U	0.017 U	0.012 U	0.014 U	0.015 U	0.015 U
RA HS SVOCs	Acenaphthene	83-32-9	mg/kg	0.022 U	0.022 U	0.02 U	0.017 U	0.012 U	0.014 U	0.015 U	0.015 U
RA HS SVOCs	Acenaphthylene	208-96-8	mg/kg	0.00550 J	0.0110 J	0.00520 J	0.00260 J	0.012 U	0.00340 J	0.015 U	0.00320 J
RA HS SVOCs	Anthracene	120-12-7	mg/kg	0.0110 J	0.0250 J	0.00670 J	0.00360 J	0.012 U	0.00640 J	0.015 U	0.00410 J
RA HS SVOCs	Benzo(a)anthracene	56-55-3	mg/kg	0.0700	0.17	0.0500	0.0260 J	0.012 U	0.0380	0.015 U	0.0290 J
RA HS SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg	0.0950	0.22	0.0670	0.0340	0.012 U	0.0470	0.015 U	0.0330
RA HS SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.24	0.95	0.15	0.0550	0.012 U	0.0690	0.015 U	0.0540
RA HS SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.0930	0.22	0.0610	0.0330 J	0.012 U	0.0360	0.015 U	0.0260 J
RA HS SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.0690	0.26	0.0510	0.0230 J	0.012 U	0.0270 J	0.015 U	0.0200 J
RA HS SVOCs	Chrysene	218-01-9	mg/kg	0.18	0.97	0.12	0.0420	0.012 U	0.0500	0.015 U	0.0370
RA HS SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.0220 J	0.0540	0.0160 J	0.00590 J	0.012 U	0.00900 J	0.015 U	0.00580 J
RA HS SVOCs	Fluoranthene	206-44-0	mg/kg	0.3	1.7	0.19	0.0760	0.012 U	0.0980	0.015 U	0.0850
RA HS SVOCs	Fluorene	86-73-7	mg/kg	0.022 U	0.0100 J	0.02 U	0.017 U	0.012 U	0.014 U	0.015 U	0.015 U
RA HS SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0850	0.24	0.0540	0.0280 J	0.012 U	0.0320	0.015 U	0.0250 J
RA HS SVOCs	Naphthalene	91-20-3	mg/kg	0.00780 J	0.00740 J	0.00720 J	0.00520 J	0.012 U	0.00500 J	0.015 U	0.015 U
RA HS SVOCs	Phenanthrene	85-01-8	mg/kg	0.0920	0.4	0.0610	0.0340 J	0.012 U	0.0540	0.015 U	0.0510
RA HS SVOCs	Pyrene	129-00-0	mg/kg	0.28	1.4	0.18	0.0920 J	0.012 U	0.13	0.015 U	0.0980
RA HS SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	1.4	6.2	0.94	0.41	0.12 U	0.54	0.15 U	0.41
RA HS SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.15	0.47	0.11	0.061	0.096 U	0.089	0.12 U	0.077
RA HS SVOCs	Total PAHs (b)	Tot-PAH	mg/kg	1.6	6.7	1.1	0.48	0.22 U	0.63	0.27 U	0.49

ATTACHMENT A, TABLE A-2C
BACKGROUND HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background
			Location ID	SSH-314	SSH-315	SSH-315	SSH-316	SSH-316	SSH-317	SSH-317	SSH-318
			Depth Interval	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft
			Sample Type Code	N	N	N	N	N	N	N	N
			Sample ID	SSH-314-CI20-1-2	SSH-315-CI20-0-1	SSH-315-CI20-1-2	SSH-316-CI20-0-1	SSH-316-CI20-1-2	SSH-317-CI20-0-1	SSH-317-CI20-1-2	SSH-318-CI20-0-1
			Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units								

Notes:
B = Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
HS = Hydric soil.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-2C
BACKGROUND HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background
				Location ID	SSH-318	SSH-319	SSH-319	SSH-320	SSH-320
				Depth Interval	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
				Sample Type Code	N	N	N	N	N
				Sample ID	SSH-318-CI20-1-2	SSH-319-CI20-0-1	SSH-319-CI20-1-2	SSH-320-CI20-0-1	SSH-320-CI20-1-2
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units						
RA HS Metals	Aluminum	7429-90-5	mg/kg	4890	6100	4210	8310	4950 B
RA HS Metals	Antimony	7440-36-0	mg/kg	0.085 U	0.160	0.07 U	0.12 U	0.063 U
RA HS Metals	Arsenic	7440-38-2	mg/kg	1.30	1.60	1.10	2.20	1.30
RA HS Metals	Barium	7440-39-3	mg/kg	6.06	7.04	5.43	8.60	6.52
RA HS Metals	Beryllium	7440-41-7	mg/kg	0.368	0.442	0.346	0.625	0.421
RA HS Metals	Cadmium	7440-43-9	mg/kg	0.034 U	0.03 U	0.028 U	0.047 U	0.025 U
RA HS Metals	Calcium	7440-70-2	mg/kg	558	729	449	1020	625
RA HS Metals	Chromium	7440-47-3	mg/kg	6.41	8.17	6.08	11.5	6.45
RA HS Metals	Cobalt	7440-48-4	mg/kg	1.51	1.83	1.90	2.51	1.81
RA HS Metals	Copper	7440-50-8	mg/kg	3.76	5.46	2.83	7.03	3.96
RA HS Metals	Iron	7439-89-6	mg/kg	5340	6320	6120	8870	6180
RA HS Metals	Lead	7439-92-1	mg/kg	38.6	45.4	17.6	50.3	18.9
RA HS Metals	Magnesium	7439-95-4	mg/kg	1320	1680	1660	2360	1420
RA HS Metals	Manganese	7439-96-5	mg/kg	63.0	69.0	71.1	90.5	71.5
RA HS Metals	Mercury	7439-97-6	mg/kg	0.0220 J	0.0440 J	0.0160 J	0.0560 J	0.0290 J
RA HS Metals	Nickel	7440-02-0	mg/kg	3.91	4.75	4.83	6.92	4.34
RA HS Metals	Potassium	7440-09-7	mg/kg	463	637	669	980	602
RA HS Metals	Selenium	7782-49-2	mg/kg	0.140 J	0.220 J	0.0620 J	0.300 J	0.100 J
RA HS Metals	Silver	7440-22-4	mg/kg	0.0250 J	0.0240 J	0.0150 J	0.0540 J	0.0230 J
RA HS Metals	Sodium	7440-23-5	mg/kg	68 U	60 U	56 U	94 U	50 U
RA HS Metals	Thallium	7440-28-0	mg/kg	0.068 U	0.06 U	0.056 U	0.094 U	0.05 U
RA HS Metals	Vanadium	7440-62-2	mg/kg	9.92	12.6	8.44	17.8	9.98
RA HS Metals	Zinc	7440-66-6	mg/kg	21.1	26.0	21.6	37.6	22.8
RA HS Other	Total Organic Carbon	TOC	mg/kg	17000 J			100000 J	18000 J
RA HS Pest PCBs	Aroclor 1016	12674-11-2	mg/kg	0.014 U	0.013 U	0.012 U	0.018 U	0.011 U
RA HS Pest PCBs	Aroclor 1221	11104-28-2	mg/kg	0.014 U	0.013 U	0.012 U	0.018 U	0.011 U
RA HS Pest PCBs	Aroclor 1232	11141-16-5	mg/kg	0.016 U	0.015 U	0.014 U	0.021 U	0.013 U
RA HS Pest PCBs	Aroclor 1242	53469-21-9	mg/kg	0.014 U	0.013 U	0.012 U	0.018 U	0.011 U
RA HS Pest PCBs	Aroclor 1248	12672-29-6	mg/kg	0.014 U	0.013 U	0.012 U	0.018 U	0.011 U
RA HS Pest PCBs	Aroclor 1254	11097-69-1	mg/kg	0.014 U	0.013 U	0.012 U	0.018 U	0.011 U
RA HS Pest PCBs	Aroclor 1260	11096-82-5	mg/kg	0.014 U	0.013 U	0.012 U	0.018 U	0.011 U
RA HS Pest PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.1 U	0.094 U	0.088 U	0.13 U	0.078 U
RA HS Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.10 U	0.093 U	0.086 U	0.13 U	0.079 U
RA HS SVOCs	1-Methylnaphthalene	90-12-0	mg/kg	0.00300 J	0.00360 J	0.014 U	0.026 U	0.013 U
RA HS SVOCs	2-Methylnaphthalene	91-57-6	mg/kg	0.018 U	0.00440 J	0.014 U	0.026 U	0.013 U
RA HS SVOCs	Acenaphthene	83-32-9	mg/kg	0.018 U	0.00320 J	0.014 U	0.026 U	0.013 U
RA HS SVOCs	Acenaphthylene	208-96-8	mg/kg	0.0120 J	0.0150 J	0.014 U	0.0110 J	0.013 U
RA HS SVOCs	Anthracene	120-12-7	mg/kg	0.0210 J	0.0280 J	0.00180 J	0.0230 J	0.013 U
RA HS SVOCs	Benzo(a)anthracene	56-55-3	mg/kg	0.13	0.23	0.0120 J	0.17	0.00750 J
RA HS SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg	0.13	0.26	0.0150 J	0.2	0.00910 J
RA HS SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.2	0.36	0.0220 J	0.27	0.0140 J
RA HS SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.0920	0.17	0.0110 J	0.14	0.0100 J
RA HS SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.0630	0.11	0.00920 J	0.0920	0.00560 J
RA HS SVOCs	Chrysene	218-01-9	mg/kg	0.14	0.24	0.0160 J	0.19	0.0120 J
RA HS SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.0250 J	0.0490	0.014 U	0.0360 J	0.013 U
RA HS SVOCs	Fluoranthene	206-44-0	mg/kg	0.32	0.42	0.0340	0.37	0.0230 J
RA HS SVOCs	Fluorene	86-73-7	mg/kg	0.0150 J	0.0160 J	0.014 U	0.0120 J	0.013 U
RA HS SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0850	0.16	0.0110 J	0.13	0.00750 J
RA HS SVOCs	Naphthalene	91-20-3	mg/kg	0.0110 J	0.0160 J	0.014 U	0.0160 J	0.013 U
RA HS SVOCs	Phenanthrene	85-01-8	mg/kg	0.22	0.25	0.0150 J	0.2	0.0110 J
RA HS SVOCs	Pyrene	129-00-0	mg/kg	0.41	0.65	0.0420	0.53	0.0270
RA HS SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	1.6	2.6	0.18	2.1	0.12
RA HS SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.30	0.34	0.028	0.31	0.10
RA HS SVOCs	Total PAHs (b)	Tot-PAH	mg/kg	1.9	3.0	0.25	2.4	0.20

ATTACHMENT A, TABLE A-2C
BACKGROUND HYDRIC SOIL ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	HS-Background	HS-Background	HS-Background	HS-Background	HS-Background
				Location ID	SSH-318	SSH-319	SSH-319	SSH-320	SSH-320
				Depth Interval	1 - 2 ft	0 - 1 ft	1 - 2 ft	0 - 1 ft	1 - 2 ft
				Sample Type Code	N	N	N	N	N
				Sample ID	SSH-318-CI20-1-2	SSH-319-CI20-0-1	SSH-319-CI20-1-2	SSH-320-CI20-0-1	SSH-320-CI20-1-2
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units						

Notes:
B = Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
HS = Hydric soil.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-3A
GROUNDWATER SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
WG	On-Project Blue Beach	BB-3	10/30/2019	BB-3-CI19	N		14.46 - 14.46 ft
WG	On-Project Blue Beach	BB-3	10/30/2019	BB-3-CI19-DUP	FD	BB-3-CI19	14.46 - 14.46 ft
WG	On-Project Blue Beach	BB-4	10/28/2019	BB-4-CI19	N		13.7 - 13.7 ft
WG	On-Project Blue Beach	BMW-3	7/23/2014	BMW-3-A	N		7.32 - 17.39 ft
WG	On-Project Blue Beach	BMW-3	10/29/2019	BMW-3-CI19	N		9.71 - 9.71 ft
WG	On-Project Blue Beach	MW-101D	7/22/2014	MW-101D-A	N		13 - 18 ft
WG	On-Project Blue Beach	MW-101D	10/23/2019	MW-101D-CI19	N		7.04 - 7.04 ft
WG	On-Project Blue Beach	MW-101S	7/22/2014	MW-101S-A	N		3 - 13 ft
WG	On-Project Blue Beach	MW-101S	10/23/2019	MW-101S-CI19	N		7.77 - 7.77 ft
WG	On-Project Blue Beach	MW-102	7/22/2014	MW-102-A	N		5 - 15 ft
WG	On-Project Blue Beach	MW-102	10/23/2019	MW-102-CI19	N		9.57 - 9.57 ft
WG	On-Project Blue Beach	MW-103	7/22/2014	MW-103-A	N		5 - 15 ft
WG	On-Project Blue Beach	MW-103	10/24/2019	MW-103-CI19	N		8.04 - 8.04 ft
WG	On-Project Blue Beach	MW-104	7/22/2014	MW-104-A	N		6 - 16 ft
WG	On-Project Blue Beach	MW-104	10/24/2019	MW-104-CI19	N		9.66 - 9.66 ft
WG	On-Project Blue Beach	MW-105	7/22/2014	MW-105-A	N		9 - 19 ft
WG	On-Project Blue Beach	MW-107	7/22/2014	MW-107-A	N		8 - 18 ft
WG	On-Project Blue Beach	MW-107	10/24/2019	MW-107-CI19	N		13.31 - 13.31 ft
WG	On-Project Blue Beach	MW-108D	7/23/2014	MW-108D-A	N		32.7 - 37.7 ft
WG	On-Project Blue Beach	MW-108D	10/24/2019	MW-108D-CI19	N		12.25 - 12.25 ft
WG	On-Project Blue Beach	MW-108S	7/23/2014	MW-108S-A	N		8 - 18 ft
WG	On-Project Blue Beach	MW-108S	10/24/2019	MW-108S-CI19	N		12.36 - 12.36 ft
WG	On-Project Blue Beach	OW-3	7/23/2014	OW-3-A	N		20.5 - 30.5 ft
WG	On-Project Blue Beach	OW-3	10/29/2019	OW-3-CI19	N		9.65 - 9.65 ft
WG	On-Project Blue Beach	OW-9	7/23/2014	OW-9-A	N		10 - 20 ft
WG	On-Project Blue Beach	OW-9	7/23/2014	OW-9-AM	N		10 - 20 ft
WG	On-Project Blue Beach	OW-9	7/23/2014	OW-99-A	FD	OW-9-A	10 - 20 ft
WG	On-Project Blue Beach	OW-9	7/23/2014	OW-9-ADUP	FD	OW-9-A	10 - 20 ft
WG	On-Project Blue Beach	OW-9	10/22/2019	OW-9-CI19	N		12.45 - 12.45 ft
WG	On-Project Blue Beach	TS-3-A	7/21/2014	TS-3-A-MW2-1720	N		17 - 20 ft
WG	On-Project Blue Beach	TS-3-A	7/21/2014	TS-3-A-MW3-2225	N		22 - 25 ft
WG	On-Project Blue Beach	TS-3-A	7/21/2014	TS-3-A-MW4-2830	N		28 - 30 ft
WG	On-Project Blue Beach	TS-3-B	7/21/2014	TS-3-B-MW1-1517	N		15 - 17 ft
WG	On-Project Blue Beach	TS-3-B	7/21/2014	TS-3-B-MW6-3940	N		39 - 40 ft
WG	On-Project Blue Beach	TS-3-B	7/21/2014	DUP 01	FD	TS-3-B-MW6-3940	39 - 40 ft
WG	On-Project Blue Beach	TS-3-B	7/21/2014	DUP01	FD	TS-3-B-MW6-3940	39 - 40 ft
WG	On-Project Blue Beach	TS-3-B	7/22/2014	TS-3-B-MW3-2526	N		25 - 26 ft
WG	On-Project Blue Beach	TS-3-B	7/22/2014	TS-3-B-MW4-3031	N		30 - 31 ft
WG	On-Project Blue Beach	TS-3-C	7/22/2014	TS-3-C-MW1-1415	N		14 - 15 ft
WG	On-Project Blue Beach	TS-3-C	7/22/2014	TS-3-C-MW2-1820	N		18 - 20 ft
WG	On-Project Blue Beach	TS-3-C	7/22/2014	TS-3-C-MW3-2324	N		23 - 24 ft
WG	On-Project Blue Beach	TS-3-C	7/22/2014	TS-3-C-MW5-2324	N		23 - 24 ft
WG	On-Project Blue Beach	TS-3-C	7/22/2014	TS-3-C-MW1-1415DUP	FD	TS-3-C-MW1-1415	14 - 15 ft
WG	On-Project Blue Beach	TS-3-D	8/5/2014	TS-3-D-MW1-1315	N		13 - 15 ft
WG	On-Project Blue Beach	TS-3-D	8/5/2014	TS-3-D-MW2-1921	N		19 - 21 ft

ATTACHMENT A, TABLE A-3A
GROUNDWATER SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
WG	On-Project Blue Beach	TS-UP-1	7/23/2014	TS-UP-1-MW1-1316	N		13 - 16 ft
WG	On-Project Blue Beach	TS-UP-1	7/23/2014	TS-UP-1-MW2-1821	N		18 - 21 ft
WG	On-Project Blue Beach	TS-UP-1	7/23/2014	TS-UP-1-MW4-2427	N		27 - 27 ft
WG	On-Project Blue Beach	TS-UP-1	7/23/2014	TS-UP-1-MW5-3033	N		30 - 33 ft
WG	On-Project Blue Beach	TS-UP-1	7/23/2014	TS-UP-1-MW6-3940	N		39 - 40 ft
WG	On-Project Blue Beach	TS-UP-1	7/23/2014	DUP 02	FD	TS-UP-1-MW6-3940	39 - 40 ft
WG	On-Project Blue Beach	TS-UP-1	7/23/2014	DUP-02	FD	TS-UP-1-MW6-3940	39 - 40 ft
WG	On-Project Blue Beach	TS-UP-1	7/23/2014	TS-UP-1-MW6-3940DUP	FD	TS-UP-1-MW6-3940	39 - 40 ft
WG	On-Project Blue Beach	TS-UP-2	7/23/2014	TS-UP-2-MW3-2225	N		22 - 25 ft
WG	On-Project Blue Beach	TS-UP-2	7/24/2014	TS-UP-2-MW1-1316	N		13 - 16 ft
WG	On-Project Blue Beach	TS-UP-2	7/24/2014	TS-UP-2-MW2-1821	N		18 - 21 ft

Notes:
FD - Field duplicate.
ft - Feet.
N - Normal sample.
WG - Groundwater.

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	BB-3	BB-3	BB-4	BMW-3	BMW-3	MW-101D	MW-101D
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	BB-3-CI19	BB-3-CI19-DUP	BB-4-CI19	BMW-3-A	BMW-3-CI19	MW-101D-A	MW-101D-CI19
				Sample Date	10/30/2019	10/30/2019	10/28/2019	7/23/2014	10/29/2019	7/22/2014	10/23/2019
				Depth Interval	14.46 - 14.46 ft	14.46 - 14.46 ft	13.7 - 13.7 ft	7.32 - 17.39 ft	9.71 - 9.71 ft	13 - 18 ft	7.04 - 7.04 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_Metals	Aluminum	7429-90-5	ug/l	174	148	40 U		40 U		68.6 J
RA_WG_Metals	Antimony	7440-36-0	ug/l	0.200 J	0.5 U	0.120 J		0.5 U		0.5 U
RA_WG_Metals	Arsenic	7440-38-2	ug/l	11.0	12.0	8.90	1 U	4 U	1 U	4 U
RA_WG_Metals	Barium	7440-39-3	ug/l	51.0	50.8	77.8	8.5 J	9.86	3 U	1.60 J
RA_WG_Metals	Beryllium	7440-41-7	ug/l	0.0790 J	0.0870 J	0.2 U		0.2 U		0.0520 J
RA_WG_Metals	Cadmium	7440-43-9	ug/l	0.270 J	0.180 J	0.2 U	0.1 J	0.0390 J	0.1 U	0.2 U
RA_WG_Metals	Calcium	7440-70-2	ug/l	40600	40300	68600		24600		2460
RA_WG_Metals	Chromium	7440-47-3	ug/l	4 U	4 U	4 U	3 U	4 U	3 U	4 U
RA_WG_Metals	Cobalt	7440-48-4	ug/l	1.92	1.87	0.3 U		0.110 J		0.140 J
RA_WG_Metals	Copper	7440-50-8	ug/l	4.09	3.45	2 U		2 U		2 U
RA_WG_Metals	Iron	7439-89-6	ug/l	67600	68700	57400		60 U		60 U
RA_WG_Metals	Lead	7439-92-1	ug/l	0.630 J	0.550 J	0.5 U	1 UJ	0.5 U	1 UJ	0.240 J
RA_WG_Metals	Magnesium	7439-95-4	ug/l	3440	3540	4710		2030		353
RA_WG_Metals	Manganese	7439-96-5	ug/l	2330	2350	1750		2.30		3.40
RA_WG_Metals	Mercury	7439-97-6	ug/l	0.0130 J	0.1 U	0.1 U	0.2 U	0.1 U	0.2 U	0.1 U
RA_WG_Metals	Nickel	7440-02-0	ug/l	1.2 U	1.2 U	1.2 U		1.2 U		1.2 U
RA_WG_Metals	Potassium	7440-09-7	ug/l	4870	4990	8730		2260		400 U
RA_WG_Metals	Selenium	7782-49-2	ug/l	3 U	3 U	3 U	2 U	0.590 J	2 UJ	0.210 J
RA_WG_Metals	Silver	7440-22-4	ug/l	0.4 U	0.4 U	0.4 U	0.17 J	0.4 U	0.1 U	0.4 U
RA_WG_Metals	Sodium	7440-23-5	ug/l	73500	73300	170000		7200		3810
RA_WG_Metals	Thallium	7440-28-0	ug/l	0.4 U	0.4 U	0.4 U		0.4 U		0.4 U
RA_WG_Metals	Vanadium	7440-62-2	ug/l	4 U	4 U	4 U		4 U		4 U
RA_WG_Metals	Zinc	7440-66-6	ug/l	7.00 J	8.70 J	4.80 J		8 U		9.00 J
RA_WG_Pest_PCBs	Aroclor 1016	12674-11-2	ug/l	0.24 UJ	0.24 UJ	0.23 UJ		0.23 U		0.23 U
RA_WG_Pest_PCBs	Aroclor 1221	11104-28-2	ug/l	0.24 UJ	0.24 UJ	0.23 UJ		0.23 U		0.23 U
RA_WG_Pest_PCBs	Aroclor 1232	11141-16-5	ug/l	0.24 UJ	0.24 UJ	0.23 UJ		0.23 U		0.23 U
RA_WG_Pest_PCBs	Aroclor 1242	53469-21-9	ug/l	0.24 UJ	0.24 UJ	0.23 UJ		0.23 U		0.23 U
RA_WG_Pest_PCBs	Aroclor 1248	12672-29-6	ug/l	0.24 UJ	0.24 UJ	0.23 UJ		0.23 U		0.23 U
RA_WG_Pest_PCBs	Aroclor 1254	11097-69-1	ug/l	0.24 UJ	0.24 UJ	0.23 UJ		0.23 U		0.23 U
RA_WG_Pest_PCBs	Aroclor 1260	11096-82-5	ug/l	0.24 UJ	0.24 UJ	0.23 UJ		0.23 U		0.23 U
RA_WG_Pest_PCBs	PCB, Total (a)	1336-36-3	ug/l	1.7 UJ	1.7 UJ	1.6 UJ		1.6 U		1.6 U
RA_WG_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	ug/l	1.7 U	1.7 U	1.6 U		1.6 U		1.6 U
RA_WG_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 UJ
RA_WG_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	ug/l	18 U		18 U		18 U		18 U
RA_WG_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	ug/l	7 U		7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	ug/l	7 U		7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	ug/l	7 U		7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	ug/l	18 U		18 U		18 U		18 U
RA_WG_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	2-Chlorophenol	95-57-8	ug/l	7 U		7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	2-Methylphenol	95-48-7	ug/l	7 U		7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	2-Nitroaniline	88-74-4	ug/l	18 U	18 U	18 U		18 U		18 U
RA_WG_SVOCs_EPHs	2-Nitrophenol	88-75-5	ug/l	7 U		7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	ug/l	7 U		7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	3-Nitroaniline	99-09-2	ug/l	18 U	18 U	18 U		18 U		18 U
RA_WG_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	ug/l	18 U		18 U		18 U		18 U
RA_WG_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	ug/l	7 U		7.1 U		7 U		7.2 U

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	BB-3	BB-3	BB-4	BMW-3	BMW-3	MW-101D	MW-101D
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	BB-3-CI19	BB-3-CI19-DUP	BB-4-CI19	BMW-3-A	BMW-3-CI19	MW-101D-A	MW-101D-CI19
				Sample Date	10/30/2019	10/30/2019	10/28/2019	7/23/2014	10/29/2019	7/22/2014	10/23/2019
				Depth Interval	14.46 - 14.46 ft	14.46 - 14.46 ft	13.7 - 13.7 ft	7.32 - 17.39 ft	9.71 - 9.71 ft	13 - 18 ft	7.04 - 7.04 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_SVOCs_EPHs	4-Chloroaniline	106-47-8	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	4-Nitroaniline	100-01-6	ug/l	18 U	18 U	18 U		18 U		18 U
RA_WG_SVOCs_EPHs	4-Nitrophenol	100-02-7	ug/l	18 UJ		18 UJ		18 UJ		18 UJ
RA_WG_SVOCs_EPHs	Benzoic acid	65-85-0	ug/l	18 UJ		18 UJ		18 UJ		18 UJ
RA_WG_SVOCs_EPHs	Benzyl Alcohol	100-51-6	ug/l	14 U	14 U	14 U		14 U		14 UJ
RA_WG_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Carbazole	86-74-8	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Dibenzofuran	132-64-9	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Diethyl Phthalate	84-66-2	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Hexachlorobenzene	118-74-1	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Hexachloroethane	67-72-1	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Isophorone	78-59-1	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	Nitrobenzene	98-95-3	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 UJ
RA_WG_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 U
RA_WG_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	ug/l	7 U	7.1 U	7.1 U		7 U		7.2 UJ
RA_WG_SVOCs_EPHs	Pentachlorophenol	87-86-5	ug/l	18 U		18 U		18 U		18 U
RA_WG_SVOCs_EPHs	Phenol	108-95-2	ug/l	7 UJ		7.1 UJ		7 UJ		7.2 UJ
RA_WG_SVOCs-SIM	1-Methylnaphthalene	90-12-0	ug/l	78.0 J	70.0 J	90.0		0.093 U		0.096 U
RA_WG_SVOCs-SIM	2-Methylnaphthalene	91-57-6	ug/l	35.0 J	28.0 J	85.0		0.093 U		0.096 U
RA_WG_SVOCs-SIM	Acenaphthene	83-32-9	ug/l	0.180 J	0.250 J	0.160 J		0.093 U		0.096 U
RA_WG_SVOCs-SIM	Acenaphthylene	208-96-8	ug/l	0.093 U	0.094 U	0.094 U		0.093 U		0.096 U
RA_WG_SVOCs-SIM	Anthracene	120-12-7	ug/l	0.093 U	0.094 U	0.094 U		0.120 J		0.096 U
RA_WG_SVOCs-SIM	Benzo(a)anthracene	56-55-3	ug/l	0.0520 J	0.0500 J	0.0960 J		0.240		0.260
RA_WG_SVOCs-SIM	Benzo(a)Pyrene	50-32-8	ug/l	0.0730 J	0.0760 J	0.220		0.220		0.096 U
RA_WG_SVOCs-SIM	Benzo(b)fluoranthene	205-99-2	ug/l	0.093 U	0.094 U	0.380		0.240		0.240
RA_WG_SVOCs-SIM	Benzo(g,h,i)Perylene	191-24-2	ug/l	0.093 U	0.094 U	0.320		0.120 J		0.096 U
RA_WG_SVOCs-SIM	Benzo(k)Fluoranthene	207-08-9	ug/l	0.093 U	0.094 U	0.170 J		0.140 J		0.096 U
RA_WG_SVOCs-SIM	Chrysene	218-01-9	ug/l	0.093 U	0.094 U	0.240		0.250		0.0520 J
RA_WG_SVOCs-SIM	Dibenzo(a,h)Anthracene	53-70-3	ug/l	0.093 U	0.094 U	0.094 U		0.093 U		0.096 U
RA_WG_SVOCs-SIM	Fluoranthene	206-44-0	ug/l	0.0710 J	0.0830 J	0.250		0.530		0.0770 J
RA_WG_SVOCs-SIM	Fluorene	86-73-7	ug/l	0.330 J	0.540 J	0.210		0.093 U		0.096 U
RA_WG_SVOCs-SIM	Indeno(1,2,3-CD)Pyrene	193-39-5	ug/l	0.093 U	0.094 U	0.230		0.140 J		0.096 U
RA_WG_SVOCs-SIM	Naphthalene	91-20-3	ug/l	160 J	150 J	250		0.093 U		0.096 U
RA_WG_SVOCs-SIM	Phenanthrene	85-01-8	ug/l	0.0970 J	0.120 J	0.150 J		0.520		0.096 U
RA_WG_SVOCs-SIM	Pyrene	129-00-0	ug/l	0.093 U	0.094 U	0.160 J		0.290		0.0890 J
RA_WG_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1-Dichloroethane	75-34-3	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1-Dichloroethene	75-35-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1-Dichloropropene	563-58-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	BB-3	BB-3	BB-4	BMW-3	BMW-3	MW-101D	MW-101D
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	BB-3-CI19	BB-3-CI19-DUP	BB-4-CI19	BMW-3-A	BMW-3-CI19	MW-101D-A	MW-101D-CI19
				Sample Date	10/30/2019	10/30/2019	10/28/2019	7/23/2014	10/29/2019	7/22/2014	10/23/2019
				Depth Interval	14.46 - 14.46 ft	14.46 - 14.46 ft	13.7 - 13.7 ft	7.32 - 17.39 ft	9.71 - 9.71 ft	13 - 18 ft	7.04 - 7.04 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_VOCs_VPHs	1,2,4-Trimethylbenzene	95-63-6	ug/l	8.10	8.10	320 J	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	0.75 U	0.75 U	0.75 U	2 U	0.75 U	2 U	0.75 U
RA_WG_VOCs_VPHs	1,2-Dibromoethane	106-93-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,2-Dichlorobenzene	95-50-1	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	1,2-Dichloroethane	107-06-2	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,2-Dichloropropane	78-87-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,3,5-Trimethylbenzene	108-67-8	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	1,3-Dichlorobenzene	541-73-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,3-Dichloropropane	142-28-9	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	1,4-Dichlorobenzene	106-46-7	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	2,2-Dichloropropane	594-20-7	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	2-Butanone (MEK)	78-93-3	ug/l	2.5 U	2.5 U	2.5 U	5 U	2.5 U	5 U	2.5 U
RA_WG_VOCs_VPHs	2-Chlorotoluene	95-49-8	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	2-Hexanone	591-78-6	ug/l	2.5 U	2.5 U	2.5 U	5 U	2.5 U	5 U	2.5 U
RA_WG_VOCs_VPHs	4-Chlorotoluene	106-43-4	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	4-Isopropyltoluene	99-87-6	ug/l	2.50	2.50	11.0 J	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	4-Methyl-2-pentanone	108-10-1	ug/l	2.5 U	2.5 U	2.5 U	5 U	2.5 U	5 U	2.5 U
RA_WG_VOCs_VPHs	Acetone	67-64-1	ug/l	11.0	11.0	2.5 UJ	5 U	2.5 U	5 U	2.5 U
RA_WG_VOCs_VPHs	Benzene	71-43-2	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	Bromobenzene	108-86-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	Bromochloromethane	74-97-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	Bromodichloromethane	75-27-4	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	Bromoform	75-25-2	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	Bromomethane	74-83-9	ug/l	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U
RA_WG_VOCs_VPHs	Carbon Disulfide	75-15-0	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	Carbon Tetrachloride	56-23-5	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	Chlorobenzene	108-90-7	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	Chloroethane	75-00-3	ug/l	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U
RA_WG_VOCs_VPHs	Chloroform	67-66-3	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	Chloromethane	74-87-3	ug/l	1 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U
RA_WG_VOCs_VPHs	cis-1,2-Dichloroethene	156-59-2	ug/l	0.5 U	0.5 U	0.5 U	3.1 J	5.50	0.5 U	0.5 U
RA_WG_VOCs_VPHs	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	dibromochloromethane	124-48-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	Dibromomethane	74-95-3	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	Dichlorodifluoromethane	75-71-8	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U
RA_WG_VOCs_VPHs	Diisopropyl Ether	108-20-3	ug/l							
RA_WG_VOCs_VPHs	Ethylbenzene	100-41-4	ug/l	4.30	4.30	4.80 J	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	Freon 113	76-13-1	ug/l	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U
RA_WG_VOCs_VPHs	Hexachlorobutadiene	87-68-3	ug/l	0.75 U	0.75 U	0.75 U	0.5 U	0.75 U	0.5 U	0.75 U
RA_WG_VOCs_VPHs	Hexane	110-54-3	ug/l							
RA_WG_VOCs_VPHs	Isopropylbenzene	98-82-8	ug/l	11.0	11.0	18.0 J	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	M,P-Xylenes	179601-23-1	ug/l	1 U	1 U	40.0 J	0.4 U	1 U	0.4 U	1 U
RA_WG_VOCs_VPHs	Methylene Chloride	75-09-2	ug/l	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	2.5 U
RA_WG_VOCs_VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	Naphthalene	91-20-3	ug/l				0.5 U		0.5 U	
RA_WG_VOCs_VPHs	n-Butylbenzene	104-51-8	ug/l	2.40	2.50	6.30 J	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	n-Propylbenzene	103-65-1	ug/l	12.0	12.0	26.0 J	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	O-Xylene	95-47-6	ug/l	0.5 U	0.5 U	0.570 J	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	sec-Butylbenzene	135-98-8	ug/l	4.40	4.40	8.90 J	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	Styrene	100-42-5	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	tert-Butylbenzene	98-06-6	ug/l	3.50	3.70	5.00 J	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	Tetrachloroethene	127-18-4	ug/l	0.5 U	0.5 U	0.5 U	0.6 J	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	Tetrahydrofuran	109-99-9	ug/l	5 U	5 U	5 U		5 U		5 U
RA_WG_VOCs_VPHs	Toluene	108-88-3	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	BB-3	BB-3	BB-4	BMW-3	BMW-3	MW-101D	MW-101D
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	BB-3-CI19	BB-3-CI19-DUP	BB-4-CI19	BMW-3-A	BMW-3-CI19	MW-101D-A	MW-101D-CI19
				Sample Date	10/30/2019	10/30/2019	10/28/2019	7/23/2014	10/29/2019	7/22/2014	10/23/2019
				Depth Interval	14.46 - 14.46 ft	14.46 - 14.46 ft	13.7 - 13.7 ft	7.32 - 17.39 ft	9.71 - 9.71 ft	13 - 18 ft	7.04 - 7.04 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_VOCs_VPHs	Xylenes, total (a)	1330-20-7	ug/l	1.5 U	1.5 U	41.0 J		1.5 U		1.5 U
RA_WG_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	ug/l	1.5 U	1.5 U	41	0.60 U	1.5 U	0.60 U	1.5 U
RA_WG_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.5 U	0.5 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U
RA_WG_VOCs_VPHs	Trichloroethylene	79-01-6	ug/l	0.5 U	0.5 U	0.5 U	26.1 J	28.0	0.5 U	0.5 U
RA_WG_VOCs_VPHs	Trichlorofluoromethane	75-69-4	ug/l	1 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U
RA_WG_VOCs_VPHs	Vinyl Chloride	75-01-4	ug/l	1 U	1 U	1 U	0.5 U	1 U	0.5 U	1 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	MW-101S	MW-101S	MW-102	MW-102	MW-103	MW-103	MW-104
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	MW-101S-A	MW-101S-CI19	MW-102-A	MW-102-CI19	MW-103-A	MW-103-CI19	MW-104-A
				Sample Date	7/22/2014	10/23/2019	7/22/2014	10/23/2019	7/22/2014	10/24/2019	7/22/2014
				Depth Interval	3 - 13 ft	7.77 - 7.77 ft	5 - 15 ft	9.57 - 9.57 ft	5 - 15 ft	8.04 - 8.04 ft	6 - 16 ft
Method Analyte Group	Compound	CAS #	Units								
RA WG Metals	Aluminum	7429-90-5	ug/l		40 U		40 U		132		
RA WG Metals	Antimony	7440-36-0	ug/l		0.5 U		0.5 U		0.5 U		
RA WG Metals	Arsenic	7440-38-2	ug/l	1 U	4 U	1 U	4 U	1 U	4 U	1 U	
RA WG Metals	Barium	7440-39-3	ug/l	3 U	1 U	12.2 J	11.6	2.9 J	8.84	5.5 J	
RA WG Metals	Beryllium	7440-41-7	ug/l		0.2 U		0.0440 J		0.0630 J		
RA WG Metals	Cadmium	7440-43-9	ug/l	0.1 U	0.0630 J	0.1 U	0.0350 J	0.1 J	0.130 J	0.1 U	
RA WG Metals	Calcium	7440-70-2	ug/l		2350		7660		3200		
RA WG Metals	Chromium	7440-47-3	ug/l	3 U	4 U	3 U	4 U	3 U	4 U	3 U	
RA WG Metals	Cobalt	7440-48-4	ug/l		0.0680 J		0.881 J		0.140 J		
RA WG Metals	Copper	7440-50-8	ug/l		2 U		2 U		2 U		
RA WG Metals	Iron	7439-89-6	ug/l		60 U		61.0 J		168		
RA WG Metals	Lead	7439-92-1	ug/l	1 UJ	0.5 U	1 UJ	0.5 U	1 UJ	0.5 U	1 UJ	
RA WG Metals	Magnesium	7439-95-4	ug/l		274		1340		540		
RA WG Metals	Manganese	7439-96-5	ug/l		1.50 J		1.40 J		5.95		
RA WG Metals	Mercury	7439-97-6	ug/l	0.2 U	0.1 U	0.2 U	0.1 U	0.2 U	0.1 U	0.2 U	
RA WG Metals	Nickel	7440-02-0	ug/l		1.2 U		1.2 U		0.240 J		
RA WG Metals	Potassium	7440-09-7	ug/l		400 U		3590		670 J		
RA WG Metals	Selenium	7782-49-2	ug/l	2 UJ	3 U	2 UJ	3 U	2 UJ	3 U	2 UJ	
RA WG Metals	Silver	7440-22-4	ug/l	0.1 U	0.4 U	0.1 U	0.4 U	0.1 U	0.4 U	0.1 U	
RA WG Metals	Sodium	7440-23-5	ug/l		2630		15000		2960		
RA WG Metals	Thallium	7440-28-0	ug/l		0.4 U		0.4 U		0.4 U		
RA WG Metals	Vanadium	7440-62-2	ug/l		4 U		4 U		4 U		
RA WG Metals	Zinc	7440-66-6	ug/l		8 U		8 U		102		
RA WG Pest PCBs	Aroclor 1016	12674-11-2	ug/l		0.24 UJ		0.23 U		0.23 U		
RA WG Pest PCBs	Aroclor 1221	11104-28-2	ug/l		0.24 UJ		0.23 U		0.23 U		
RA WG Pest PCBs	Aroclor 1232	11141-16-5	ug/l		0.24 UJ		0.23 U		0.23 U		
RA WG Pest PCBs	Aroclor 1242	53469-21-9	ug/l		0.24 UJ		0.23 U		0.23 U		
RA WG Pest PCBs	Aroclor 1248	12672-29-6	ug/l		0.24 UJ		0.23 U		0.23 U		
RA WG Pest PCBs	Aroclor 1254	11097-69-1	ug/l		0.24 UJ		0.23 U		0.23 U		
RA WG Pest PCBs	Aroclor 1260	11096-82-5	ug/l		0.24 UJ		0.23 U		0.23 U		
RA WG Pest PCBs	PCB, Total (a)	1336-36-3	ug/l		1.7 UJ		1.6 U		1.6 U		
RA WG Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	ug/l		1.7 U		1.6 U		1.6 U		
RA WG SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l		7.1 U		7.2 U		7.1 UJ		
RA WG SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	ug/l		7.1 U		7.2 U		7.1 UJ		
RA WG SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	ug/l		7.1 UJ		7.2 UJ		7.1 UJ		
RA WG SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	ug/l		7.1 U		7.2 U		7.1 UJ		
RA WG SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	ug/l		18 U		18 U				
RA WG SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	ug/l		7.1 U		7.2 U				
RA WG SVOCs EPHs	2,4-Dichlorophenol	120-83-2	ug/l		7.1 U		7.2 U				
RA WG SVOCs EPHs	2,4-Dimethylphenol	105-67-9	ug/l		7.1 U		7.2 U				
RA WG SVOCs EPHs	2,4-Dinitrophenol	51-28-5	ug/l		18 U		18 U				
RA WG SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	ug/l		7.1 U		7.2 U		7.1 UJ		
RA WG SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	ug/l		7.1 U		7.2 U		7.1 UJ		
RA WG SVOCs EPHs	2-Chloronaphthalene	91-58-7	ug/l		7.1 U		7.2 U		7.1 UJ		
RA WG SVOCs EPHs	2-Chlorophenol	95-57-8	ug/l		7.1 U		7.2 U				
RA WG SVOCs EPHs	2-Methylphenol	95-48-7	ug/l		7.1 U		7.2 U				
RA WG SVOCs EPHs	2-Nitroaniline	88-74-4	ug/l		18 U		18 U		18 UJ		
RA WG SVOCs EPHs	2-Nitrophenol	88-75-5	ug/l		7.1 U		7.2 U				
RA WG SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	ug/l		7.1 U		7.2 U				
RA WG SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	ug/l		7.1 U		7.2 U		7.1 UJ		
RA WG SVOCs EPHs	3-Nitroaniline	99-09-2	ug/l		18 U		18 U		18 UJ		
RA WG SVOCs EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	ug/l		18 U		18 U				
RA WG SVOCs EPHs	4-Bromophenyl-Phenylether	101-55-3	ug/l		7.1 U		7.2 U		7.1 UJ		
RA WG SVOCs EPHs	4-Chloro-3-Methylphenol	59-50-7	ug/l		7.1 U		7.2 U				

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	MW-101S	MW-101S	MW-102	MW-102	MW-103	MW-103	MW-104
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	MW-101S-A	MW-101S-CI19	MW-102-A	MW-102-CI19	MW-103-A	MW-103-CI19	MW-104-A
				Sample Date	7/22/2014	10/23/2019	7/22/2014	10/23/2019	7/22/2014	10/24/2019	7/22/2014
				Depth Interval	3 - 13 ft	7.77 - 7.77 ft	5 - 15 ft	9.57 - 9.57 ft	5 - 15 ft	8.04 - 8.04 ft	6 - 16 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_SVOCs_EPHs	4-Chloroaniline	106-47-8	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	4-Nitroaniline	100-01-6	ug/l		18 U		18 U			18 UJ	
RA_WG_SVOCs_EPHs	4-Nitrophenol	100-02-7	ug/l		18 UJ		18 UJ				
RA_WG_SVOCs_EPHs	Benzoic acid	65-85-0	ug/l		18 UJ		18 UJ				
RA_WG_SVOCs_EPHs	Benzyl Alcohol	100-51-6	ug/l		14 UJ		14 U			14 UJ	
RA_WG_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Carbazole	86-74-8	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Dibenzofuran	132-64-9	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Diethyl Phthalate	84-66-2	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Hexachlorobenzene	118-74-1	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Hexachloroethane	67-72-1	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Isophorone	78-59-1	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Nitrobenzene	98-95-3	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	ug/l		7.1 UJ		7.2 UJ			7.1 UJ	
RA_WG_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	ug/l		7.1 U		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	ug/l		7.1 UJ		7.2 U			7.1 UJ	
RA_WG_SVOCs_EPHs	Pentachlorophenol	87-86-5	ug/l		18 U		18 U				
RA_WG_SVOCs_EPHs	Phenol	108-95-2	ug/l		7.1 UJ		7.2 UJ				
RA_WG_SVOCs-SIM	1-Methylnaphthalene	90-12-0	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	2-Methylnaphthalene	91-57-6	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Acenaphthene	83-32-9	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Acenaphthylene	208-96-8	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Anthracene	120-12-7	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Benzo(a)anthracene	56-55-3	ug/l		0.095 U		0.096 UJ			0.094 UJ	
RA_WG_SVOCs-SIM	Benzo(a)Pyrene	50-32-8	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Benzo(b)fluoranthene	205-99-2	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Benzo(g,h,i)Perylene	191-24-2	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Benzo(k)Fluoranthene	207-08-9	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Chrysene	218-01-9	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Dibenzo(a,h)Anthracene	53-70-3	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Fluoranthene	206-44-0	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Fluorene	86-73-7	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Indeno(1,2,3-CD)Pyrene	193-39-5	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Naphthalene	91-20-3	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Phenanthrene	85-01-8	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_SVOCs-SIM	Pyrene	129-00-0	ug/l		0.095 U		0.096 U			0.094 U	
RA_WG_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.5 U	0.2 U
RA_WG_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1-Dichloroethane	75-34-3	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1-Dichloroethene	75-35-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1-Dichloropropene	563-58-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	MW-101S	MW-101S	MW-102	MW-102	MW-103	MW-103	MW-104
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	MW-101S-A	MW-101S-CI19	MW-102-A	MW-102-CI19	MW-103-A	MW-103-CI19	MW-104-A
				Sample Date	7/22/2014	10/23/2019	7/22/2014	10/23/2019	7/22/2014	10/24/2019	7/22/2014
				Depth Interval	3 - 13 ft	7.77 - 7.77 ft	5 - 15 ft	9.57 - 9.57 ft	5 - 15 ft	8.04 - 8.04 ft	6 - 16 ft
Method Analyte Group	Compound	CAS #	Units								
RA WG VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	2 U	0.75 U	2 U	0.75 U	2 U	0.75 U	2 U
RA WG VOCs VPHs	1,2-Dibromoethane	106-93-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	1,2-Dichlorobenzene	95-50-1	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	1,2-Dichloroethane	107-06-2	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	1,2-Dichloropropane	78-87-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	1,3-Dichlorobenzene	541-73-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	1,3-Dichloropropane	142-28-9	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	1,4-Dichlorobenzene	106-46-7	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	2,2-Dichloropropane	594-20-7	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	2-Butanone (MEK)	78-93-3	ug/l	5 U	2.5 U	5 U	2.5 U	5 U	2.5 U	5 U
RA WG VOCs VPHs	2-Chlorotoluene	95-49-8	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	2-Hexanone	591-78-6	ug/l	5 U	2.5 U	5 U	2.5 U	5 U	2.5 U	5 U
RA WG VOCs VPHs	4-Chlorotoluene	106-43-4	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	4-Isopropyltoluene	99-87-6	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	4-Methyl-2-pentanone	108-10-1	ug/l	5 U	2.5 U	5 U	2.5 U	5 U	2.5 U	5 U
RA WG VOCs VPHs	Acetone	67-64-1	ug/l	5 U	2.5 U	5 U	2.5 U	5 U	2.5 U	5 U
RA WG VOCs VPHs	Benzene	71-43-2	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Bromobenzene	108-86-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Bromochloromethane	74-97-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Bromodichloromethane	75-27-4	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Bromoform	75-25-2	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Bromomethane	74-83-9	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U
RA WG VOCs VPHs	Carbon Disulfide	75-15-0	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Carbon Tetrachloride	56-23-5	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Chlorobenzene	108-90-7	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Chloroethane	75-00-3	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U
RA WG VOCs VPHs	Chloroform	67-66-3	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Chloromethane	74-87-3	ug/l	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U
RA WG VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	dibromochloromethane	124-48-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Dibromomethane	74-95-3	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Dichlorodifluoromethane	75-71-8	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U
RA WG VOCs VPHs	Diisopropyl Ether	108-20-3	ug/l							
RA WG VOCs VPHs	Ethylbenzene	100-41-4	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Freon 113	76-13-1	ug/l		0.5 U		0.5 U		0.5 U	
RA WG VOCs VPHs	Hexachlorobutadiene	87-68-3	ug/l	0.5 U	0.75 U	0.5 U	0.75 U	0.5 U	0.75 U	0.5 U
RA WG VOCs VPHs	Hexane	110-54-3	ug/l							
RA WG VOCs VPHs	Isopropylbenzene	98-82-8	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	M,P-Xylenes	179601-23-1	ug/l	0.4 U	1 U	0.4 U	1 U	0.4 U	1 U	0.4 U
RA WG VOCs VPHs	Methylene Chloride	75-09-2	ug/l	0.5 U	2.5 U	0.5 U	2.5 U	0.5 U	2.5 U	0.5 U
RA WG VOCs VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Naphthalene	91-20-3	ug/l	0.5 U		0.5 U		0.5 U		0.5 U
RA WG VOCs VPHs	n-Butylbenzene	104-51-8	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	n-Propylbenzene	103-65-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	O-Xylene	95-47-6	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	sec-Butylbenzene	135-98-8	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Styrene	100-42-5	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	tert-Butylbenzene	98-06-6	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Tetrachloroethene	127-18-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Tetrahydrofuran	109-99-9	ug/l		5 U		5 U		5 U	
RA WG VOCs VPHs	Toluene	108-88-3	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	MW-101S	MW-101S	MW-102	MW-102	MW-103	MW-103	MW-104
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	MW-101S-A	MW-101S-CI19	MW-102-A	MW-102-CI19	MW-103-A	MW-103-CI19	MW-104-A
				Sample Date	7/22/2014	10/23/2019	7/22/2014	10/23/2019	7/22/2014	10/24/2019	7/22/2014
				Depth Interval	3 - 13 ft	7.77 - 7.77 ft	5 - 15 ft	9.57 - 9.57 ft	5 - 15 ft	8.04 - 8.04 ft	6 - 16 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_VOCs_VPHs	Xylenes, total (a)	1330-20-7	ug/l		1.5 U		1.5 U		1.5 U		
RA_WG_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	ug/l	0.60 U	1.5 U	0.60 U	1.5 U	0.60 U	1.5 U	0.60 U	
RA_WG_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	
RA_WG_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	
RA_WG_VOCs_VPHs	Trichloroethylene	79-01-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	
RA_WG_VOCs_VPHs	Trichlorofluoromethane	75-69-4	ug/l	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	
RA_WG_VOCs_VPHs	Vinyl Chloride	75-01-4	ug/l	0.5 U	1 U	0.5 U	1 U	0.5 U	1 U	0.5 U	

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	MW-104	MW-105	MW-107	MW-107	MW-108D	MW-108D	MW-108S
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	MW-104-CI19	MW-105-A	MW-107-A	MW-107-CI19	MW-108D-A	MW-108D-CI19	MW-108S-A
				Sample Date	10/24/2019	7/22/2014	7/22/2014	10/24/2019	7/23/2014	10/24/2019	7/23/2014
				Depth Interval	9.66 - 9.66 ft	9 - 19 ft	8 - 18 ft	13.31 - 13.31 ft	32.7 - 37.7 ft	12.25 - 12.25 ft	8 - 18 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_Metals	Aluminum	7429-90-5	ug/l	40 U			40 U		107		
RA_WG_Metals	Antimony	7440-36-0	ug/l	2.22			0.5 U		0.5 U		
RA_WG_Metals	Arsenic	7440-38-2	ug/l	4 U	3.1	1 U	2.90 J	1 U	4 U	1 U	
RA_WG_Metals	Barium	7440-39-3	ug/l	14.3	46.3	104	92.1	4.8 J	4.91	80.3	
RA_WG_Metals	Beryllium	7440-41-7	ug/l	0.2 U			0.2 U		0.140 J		
RA_WG_Metals	Cadmium	7440-43-9	ug/l	0.2 U	0.1 U	2.8	1.16	0.12 J	0.160 J		
RA_WG_Metals	Calcium	7440-70-2	ug/l	37700			29900		8500		
RA_WG_Metals	Chromium	7440-47-3	ug/l	4 U	3 U	3 U	4 U	3 U	4 U	2.1 J	
RA_WG_Metals	Cobalt	7440-48-4	ug/l	0.120 J			1.04		0.944 J		
RA_WG_Metals	Copper	7440-50-8	ug/l	3.62			2 U		2 U		
RA_WG_Metals	Iron	7439-89-6	ug/l	80.0 J			6060		581		
RA_WG_Metals	Lead	7439-92-1	ug/l	0.5 U	1 UJ	1 UJ	0.5 U	1 UJ	0.5 U	1 UJ	
RA_WG_Metals	Magnesium	7439-95-4	ug/l	685			1740		2390		
RA_WG_Metals	Manganese	7439-96-5	ug/l	4.44			38.0		1340		
RA_WG_Metals	Mercury	7439-97-6	ug/l	0.1 U	0.2 U	0.2 U	0.1 U	0.2 U	0.1 U	0.2 U	
RA_WG_Metals	Nickel	7440-02-0	ug/l	0.240 J			1.00 J		0.520 J		
RA_WG_Metals	Potassium	7440-09-7	ug/l	3020			16000		1690		
RA_WG_Metals	Selenium	7782-49-2	ug/l	3 U	2 UJ	2 UJ	3 U	2 U	3 U	2 U	
RA_WG_Metals	Silver	7440-22-4	ug/l	0.4 U	0.1 U	0.1 U	0.4 U	0.1 U	0.4 U	0.1 U	
RA_WG_Metals	Sodium	7440-23-5	ug/l	56300			46500		32200		
RA_WG_Metals	Thallium	7440-28-0	ug/l	0.4 U			0.4 U		0.4 U		
RA_WG_Metals	Vanadium	7440-62-2	ug/l	4 U			4 U		4 U		
RA_WG_Metals	Zinc	7440-66-6	ug/l	4.00 J			21.0		9.60 J		
RA_WG_Pest_PCBs	Aroclor 1016	12674-11-2	ug/l	0.23 U			0.24 UJ		0.24 UJ		
RA_WG_Pest_PCBs	Aroclor 1221	11104-28-2	ug/l	0.23 U			0.24 UJ		0.24 UJ		
RA_WG_Pest_PCBs	Aroclor 1232	11141-16-5	ug/l	0.23 U			0.24 UJ		0.24 UJ		
RA_WG_Pest_PCBs	Aroclor 1242	53469-21-9	ug/l	0.23 U			0.24 UJ		0.24 UJ		
RA_WG_Pest_PCBs	Aroclor 1248	12672-29-6	ug/l	0.23 U			0.24 UJ		0.24 UJ		
RA_WG_Pest_PCBs	Aroclor 1254	11097-69-1	ug/l	0.23 U			0.24 UJ		0.24 UJ		
RA_WG_Pest_PCBs	Aroclor 1260	11096-82-5	ug/l	0.23 U			0.24 UJ		0.24 UJ		
RA_WG_Pest_PCBs	PCB, Total (a)	1336-36-3	ug/l	1.6 U			1.7 UJ		1.7 UJ		
RA_WG_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	ug/l	1.6 U			1.7 U		1.7 U		
RA_WG_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l	7.1 UJ			7.1 U		7.4 UJ		
RA_WG_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	ug/l	7.1 UJ			7.1 U		7.4 UJ		
RA_WG_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	ug/l	7.1 UJ			7.1 UJ		7.4 UJ		
RA_WG_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	ug/l	7.1 UJ			7.1 U		7.4 UJ		
RA_WG_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	ug/l	18 UJ			18 U		18 U		
RA_WG_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	ug/l	7.1 UJ			7.1 U		7.4 U		
RA_WG_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	ug/l	7.1 UJ			7.1 U		7.4 U		
RA_WG_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	ug/l	7.1 UJ			7.1 U		7.4 U		
RA_WG_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	ug/l	18 UJ			18 U		18 U		
RA_WG_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	ug/l	7.1 UJ			7.1 U		7.4 UJ		
RA_WG_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	ug/l	7.1 UJ			7.1 U		7.4 UJ		
RA_WG_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	ug/l	7.1 UJ			7.1 U		7.4 UJ		
RA_WG_SVOCs_EPHs	2-Chlorophenol	95-57-8	ug/l	7.1 UJ			7.1 U		7.4 U		
RA_WG_SVOCs_EPHs	2-Methylphenol	95-48-7	ug/l	7.1 UJ			7.1 U		7.4 U		
RA_WG_SVOCs_EPHs	2-Nitroaniline	88-74-4	ug/l	18 UJ			18 U		18 UJ		
RA_WG_SVOCs_EPHs	2-Nitrophenol	88-75-5	ug/l	7.1 UJ			7.1 U		7.4 U		
RA_WG_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	ug/l	7.1 UJ			7.1 U		7.4 U		
RA_WG_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	ug/l	7.1 UJ			7.1 U		7.4 UJ		
RA_WG_SVOCs_EPHs	3-Nitroaniline	99-09-2	ug/l	18 UJ			18 U		18 UJ		
RA_WG_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	ug/l	18 UJ			18 U		18 U		
RA_WG_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	ug/l	7.1 UJ			7.1 U		7.4 UJ		
RA_WG_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	ug/l	7.1 UJ			7.1 U		7.4 U		

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	MW-104	MW-105	MW-107	MW-107	MW-108D	MW-108D	MW-108S
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	MW-104-CI19	MW-105-A	MW-107-A	MW-107-CI19	MW-108D-A	MW-108D-CI19	MW-108S-A
				Sample Date	10/24/2019	7/22/2014	7/22/2014	10/24/2019	7/23/2014	10/24/2019	7/23/2014
				Depth Interval	9.66 - 9.66 ft	9 - 19 ft	8 - 18 ft	13.31 - 13.31 ft	32.7 - 37.7 ft	12.25 - 12.25 ft	8 - 18 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_SVOCs_EPHs	4-Chloroaniline	106-47-8	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	4-Nitroaniline	100-01-6	ug/l	18 UJ			18 U		18 UJ	
RA_WG_SVOCs_EPHs	4-Nitrophenol	100-02-7	ug/l	18 UJ			18 UJ		18 UJ	
RA_WG_SVOCs_EPHs	Benzoic acid	65-85-0	ug/l	18 UJ			18 UJ		18 UJ	
RA_WG_SVOCs_EPHs	Benzyl Alcohol	100-51-6	ug/l	14 UJ			14 U		15 UJ	
RA_WG_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Carbazole	86-74-8	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Dibenzofuran	132-64-9	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Diethyl Phthalate	84-66-2	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Hexachlorobenzene	118-74-1	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Hexachloroethane	67-72-1	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Isophorone	78-59-1	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Nitrobenzene	98-95-3	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	ug/l	7.1 UJ			7.1 UJ		7.4 UJ	
RA_WG_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	ug/l	7.1 UJ			7.1 U		7.4 UJ	
RA_WG_SVOCs_EPHs	Pentachlorophenol	87-86-5	ug/l	18 UJ			18 U		18 U	
RA_WG_SVOCs_EPHs	Phenol	108-95-2	ug/l	7.1 UJ			7.1 UJ		7.4 UJ	
RA_WG_SVOCs-SIM	1-Methylnaphthalene	90-12-0	ug/l	0.094 U			0.380		0.098 U	
RA_WG_SVOCs-SIM	2-Methylnaphthalene	91-57-6	ug/l	0.094 U			0.094 U		0.098 U	
RA_WG_SVOCs-SIM	Acenaphthene	83-32-9	ug/l	0.094 U			0.094 U		0.098 U	
RA_WG_SVOCs-SIM	Acenaphthylene	208-96-8	ug/l	0.094 U			0.094 U		0.098 U	
RA_WG_SVOCs-SIM	Anthracene	120-12-7	ug/l	0.094 U			0.094 U		0.098 U	
RA_WG_SVOCs-SIM	Benzo(a)anthracene	56-55-3	ug/l	0.094 UJ			0.094 UJ		0.098 UJ	
RA_WG_SVOCs-SIM	Benzo(a)Pyrene	50-32-8	ug/l	0.094 U			0.094 U		0.098 U	
RA_WG_SVOCs-SIM	Benzo(b)fluoranthene	205-99-2	ug/l	0.094 U			0.094 U		0.098 U	
RA_WG_SVOCs-SIM	Benzo(g,h,i)Perylene	191-24-2	ug/l	0.094 U			0.094 U		0.098 U	
RA_WG_SVOCs-SIM	Benzo(k)Fluoranthene	207-08-9	ug/l	0.094 U			0.094 U		0.098 U	
RA_WG_SVOCs-SIM	Chrysene	218-01-9	ug/l	0.0510 J			0.0640 J		0.098 U	
RA_WG_SVOCs-SIM	Dibenzo(a,h)Anthracene	53-70-3	ug/l	0.094 U			0.094 U		0.098 U	
RA_WG_SVOCs-SIM	Fluoranthene	206-44-0	ug/l	0.0960 J			0.110 J		0.098 U	
RA_WG_SVOCs-SIM	Fluorene	86-73-7	ug/l	0.094 U			0.0610 J		0.098 U	
RA_WG_SVOCs-SIM	Indeno(1,2,3-CD)Pyrene	193-39-5	ug/l	0.094 U			0.150 J		0.098 U	
RA_WG_SVOCs-SIM	Naphthalene	91-20-3	ug/l	0.094 U			0.0920 J		0.098 U	
RA_WG_SVOCs-SIM	Phenanthrene	85-01-8	ug/l	0.094 U			0.094 U		0.098 U	
RA_WG_SVOCs-SIM	Pyrene	129-00-0	ug/l	0.150 J			0.160 J		0.098 U	
RA_WG_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.5 U	0.2 U	0.2 J	0.5 U	0.2 U	0.5 U	0.2 U
RA_WG_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	ug/l	0.5 U	0.5 U	0.4 J	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1-Dichloroethane	75-34-3	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1-Dichloroethene	75-35-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,1-Dichloropropene	563-58-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA_WG_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	MW-104	MW-105	MW-107	MW-107	MW-108D	MW-108D	MW-108S
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	MW-104-CI19	MW-105-A	MW-107-A	MW-107-CI19	MW-108D-A	MW-108D-CI19	MW-108S-A
				Sample Date	10/24/2019	7/22/2014	7/22/2014	10/24/2019	7/23/2014	10/24/2019	7/23/2014
				Depth Interval	9.66 - 9.66 ft	9 - 19 ft	8 - 18 ft	13.31 - 13.31 ft	32.7 - 37.7 ft	12.25 - 12.25 ft	8 - 18 ft
Method Analyte Group	Compound	CAS #	Units								
RA WG VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	ug/l	0.5 U	0.3 J	0.3 J	0.5 U	0.2 U	0.260 J	0.2 U
RA WG VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	0.75 U	2 U	2 U	0.75 U	2 U	0.75 U	2 U
RA WG VOCs VPHs	1,2-Dibromoethane	106-93-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	1,2-Dichlorobenzene	95-50-1	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	1,2-Dichloroethane	107-06-2	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	1,2-Dichloropropane	78-87-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	ug/l	0.5 U	0.2 J	0.8 J	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	1,3-Dichlorobenzene	541-73-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	1,3-Dichloropropane	142-28-9	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	1,4-Dichlorobenzene	106-46-7	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	2,2-Dichloropropane	594-20-7	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	2-Butanone (MEK)	78-93-3	ug/l	2.5 U	5 U	5 U	2.5 U	5 U	2.5 U	5 U
RA WG VOCs VPHs	2-Chlorotoluene	95-49-8	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	2-Hexanone	591-78-6	ug/l	2.5 U	5 U	5 U	2.5 U	5 U	2.5 U	5 U
RA WG VOCs VPHs	4-Chlorotoluene	106-43-4	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	4-Isopropyltoluene	99-87-6	ug/l	0.5 U	1.7	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	4-Methyl-2-pentanone	108-10-1	ug/l	2.5 U	5 U	5 U	2.5 U	5 U	2.5 U	5 U
RA WG VOCs VPHs	Acetone	67-64-1	ug/l	2.5 U	5 U	5 U	2.5 U	5 U	2.5 U	5 U
RA WG VOCs VPHs	Benzene	71-43-2	ug/l	0.5 U	0.2 J	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Bromobenzene	108-86-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Bromochloromethane	74-97-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Bromodichloromethane	75-27-4	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Bromoform	75-25-2	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Bromomethane	74-83-9	ug/l	1 U	1 U	1 U	1 U	1 UJ	1 U	1 UJ
RA WG VOCs VPHs	Carbon Disulfide	75-15-0	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Carbon Tetrachloride	56-23-5	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Chlorobenzene	108-90-7	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Chloroethane	75-00-3	ug/l	1 U	1 U	1 U	1 U	1 UJ	1 U	1 UJ
RA WG VOCs VPHs	Chloroform	67-66-3	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Chloromethane	74-87-3	ug/l	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U
RA WG VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	ug/l	0.5 U	0.5 U	0.2 J	0.770 J	0.5 UJ	0.5 U	0.5 UJ
RA WG VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	dibromochloromethane	124-48-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Dibromomethane	74-95-3	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Dichlorodifluoromethane	75-71-8	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U
RA WG VOCs VPHs	Diisopropyl Ether	108-20-3	ug/l							
RA WG VOCs VPHs	Ethylbenzene	100-41-4	ug/l	0.5 U	0.2 J	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Freon 113	76-13-1	ug/l	0.5 U			0.5 U		0.5 U	
RA WG VOCs VPHs	Hexachlorobutadiene	87-68-3	ug/l	0.75 U	0.5 U	0.5 U	0.75 U	0.5 U	0.75 U	0.5 U
RA WG VOCs VPHs	Hexane	110-54-3	ug/l							
RA WG VOCs VPHs	Isopropylbenzene	98-82-8	ug/l	0.5 U	7.9	0.4 J	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	M,P-Xylenes	179601-23-1	ug/l	1 U	0.4 U	0.4 U	1 U	0.4 U	1 U	0.4 U
RA WG VOCs VPHs	Methylene Chloride	75-09-2	ug/l	2.5 U	0.5 U	0.5 U	2.5 U	0.5 U	2.5 U	0.5 U
RA WG VOCs VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Naphthalene	91-20-3	ug/l		0.8 J	0.3 J		0.5 U		0.5 U
RA WG VOCs VPHs	n-Butylbenzene	104-51-8	ug/l	0.5 U	0.2 U	0.3 J	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	n-Propylbenzene	103-65-1	ug/l	0.5 U	0.7 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	O-Xylene	95-47-6	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	sec-Butylbenzene	135-98-8	ug/l	0.5 U	7.3	0.6 J	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Styrene	100-42-5	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	tert-Butylbenzene	98-06-6	ug/l	0.5 U	3.3	0.5 J	0.5 U	0.2 U	0.5 U	0.2 U
RA WG VOCs VPHs	Tetrachloroethene	127-18-4	ug/l	0.5 U	0.5 U	5.8	0.5 U	0.5 U	0.5 U	1.7
RA WG VOCs VPHs	Tetrahydrofuran	109-99-9	ug/l	5 U			5 U		5 U	
RA WG VOCs VPHs	Toluene	108-88-3	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	MW-104	MW-105	MW-107	MW-107	MW-108D	MW-108D	MW-108S
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	MW-104-CI19	MW-105-A	MW-107-A	MW-107-CI19	MW-108D-A	MW-108D-CI19	MW-108S-A
				Sample Date	10/24/2019	7/22/2014	7/22/2014	10/24/2019	7/23/2014	10/24/2019	7/23/2014
				Depth Interval	9.66 - 9.66 ft	9 - 19 ft	8 - 18 ft	13.31 - 13.31 ft	32.7 - 37.7 ft	12.25 - 12.25 ft	8 - 18 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_VOCs_VPHs	Xylenes, total (a)	1330-20-7	ug/l	1.5 U			1.5 U		1.5 U		
RA_WG_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	ug/l	1.5 U	0.60 U	0.60 U	1.5 U	0.60 U	1.5 U	0.60 U	
RA_WG_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	
RA_WG_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.5 U	0.2 U	
RA_WG_VOCs_VPHs	Trichloroethylene	79-01-6	ug/l	0.5 U	0.5 U	0.4 J	0.5 U	0.5 UJ	0.5 U	1.6 J	
RA_WG_VOCs_VPHs	Trichlorofluoromethane	75-69-4	ug/l	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	
RA_WG_VOCs_VPHs	Vinyl Chloride	75-01-4	ug/l	1 U	0.5 U	0.5 U	1 U	0.5 U	1 U	0.5 U	

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	MW-108S	OW-3	OW-3	OW-9	OW-9	OW-9	OW-9
				Sample Type Code	N	N	N	N	N	FD	FD
				Sample ID	MW-108S-CI19	OW-3-A	OW-3-CI19	OW-9-A	OW-9-AM	OW-99-A	OW-9-ADUP
				Sample Date	10/24/2019	7/23/2014	10/29/2019	7/23/2014	7/23/2014	7/23/2014	7/23/2014
				Depth Interval	12.36 - 12.36 ft	20.5 - 30.5 ft	9.65 - 9.65 ft	10 - 20 ft	10 - 20 ft	10 - 20 ft	10 - 20 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_Metals	Aluminum	7429-90-5	ug/l	40 U		40 U					
RA_WG_Metals	Antimony	7440-36-0	ug/l	0.5 U		0.5 U					
RA_WG_Metals	Arsenic	7440-38-2	ug/l	4 U	1 U	4 U	4.5		4.9	5	
RA_WG_Metals	Barium	7440-39-3	ug/l	99.1	24.8 J	6.05	16.6 J		17.7 J	17.6 J	
RA_WG_Metals	Beryllium	7440-41-7	ug/l	0.2 U		0.2 U					
RA_WG_Metals	Cadmium	7440-43-9	ug/l	31.2	0.26	0.230 J	1.84		1.94		
RA_WG_Metals	Calcium	7440-70-2	ug/l	75500		19800					
RA_WG_Metals	Chromium	7440-47-3	ug/l	9.68	3 U	4 U	5.7 J		6.4 J	6.2 J	
RA_WG_Metals	Cobalt	7440-48-4	ug/l	0.3 U		3.48					
RA_WG_Metals	Copper	7440-50-8	ug/l	3.65		3.70					
RA_WG_Metals	Iron	7439-89-6	ug/l	65.0 J		60 U					
RA_WG_Metals	Lead	7439-92-1	ug/l	0.5 U	1 UJ	0.0810 J	0.8 J		1 UJ	1 UJ	
RA_WG_Metals	Magnesium	7439-95-4	ug/l	9110		5350					
RA_WG_Metals	Manganese	7439-96-5	ug/l	3.40		654					
RA_WG_Metals	Mercury	7439-97-6	ug/l	0.1 U	0.2 U	0.1 U	0.2 U		0.2 U	0.2 U	
RA_WG_Metals	Nickel	7440-02-0	ug/l	1.30 J		3.63					
RA_WG_Metals	Potassium	7440-09-7	ug/l	9680		3980					
RA_WG_Metals	Selenium	7782-49-2	ug/l	3 U	2 U	3 U	2 U		2 U	2 U	
RA_WG_Metals	Silver	7440-22-4	ug/l	0.4 U	0.1 U	0.4 U	0.1 U		0.1 U	0.1 U	
RA_WG_Metals	Sodium	7440-23-5	ug/l	96500		12600					
RA_WG_Metals	Thallium	7440-28-0	ug/l	0.4 U		0.4 U					
RA_WG_Metals	Vanadium	7440-62-2	ug/l	4 U		4 U					
RA_WG_Metals	Zinc	7440-66-6	ug/l	12.0		6.40 J					
RA_WG_Pest_PCBs	Aroclor 1016	12674-11-2	ug/l	0.24 U		0.23 U					
RA_WG_Pest_PCBs	Aroclor 1221	11104-28-2	ug/l	0.24 U		0.23 U					
RA_WG_Pest_PCBs	Aroclor 1232	11141-16-5	ug/l	0.24 U		0.23 U					
RA_WG_Pest_PCBs	Aroclor 1242	53469-21-9	ug/l	0.24 U		0.23 U					
RA_WG_Pest_PCBs	Aroclor 1248	12672-29-6	ug/l	0.24 U		0.23 U					
RA_WG_Pest_PCBs	Aroclor 1254	11097-69-1	ug/l	0.24 U		0.23 U					
RA_WG_Pest_PCBs	Aroclor 1260	11096-82-5	ug/l	0.24 U		0.23 U					
RA_WG_Pest_PCBs	PCB, Total (a)	1336-36-3	ug/l	1.6 U		1.6 U					
RA_WG_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	ug/l	1.7 U		1.6 U					
RA_WG_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	ug/l	18 UJ		18 U					
RA_WG_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	ug/l	18 UJ		18 U					
RA_WG_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	2-Chlorophenol	95-57-8	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	2-Methylphenol	95-48-7	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	2-Nitroaniline	88-74-4	ug/l	18 UJ		18 U					
RA_WG_SVOCs_EPHs	2-Nitrophenol	88-75-5	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	3-Nitroaniline	99-09-2	ug/l	18 UJ		18 U					
RA_WG_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	ug/l	18 UJ		18 U					
RA_WG_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	ug/l	7 UJ		7 U					

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	MW-108S	OW-3	OW-3	OW-9	OW-9	OW-9	OW-9
				Sample Type Code	N	N	N	N	N	FD	FD
				Sample ID	MW-108S-CI19	OW-3-A	OW-3-CI19	OW-9-A	OW-9-AM	OW-99-A	OW-9-ADUP
				Sample Date	10/24/2019	7/23/2014	10/29/2019	7/23/2014	7/23/2014	7/23/2014	7/23/2014
				Depth Interval	12.36 - 12.36 ft	20.5 - 30.5 ft	9.65 - 9.65 ft	10 - 20 ft	10 - 20 ft	10 - 20 ft	10 - 20 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_SVOCs_EPHs	4-Chloroaniline	106-47-8	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	4-Nitroaniline	100-01-6	ug/l	18 UJ		18 U					
RA_WG_SVOCs_EPHs	4-Nitrophenol	100-02-7	ug/l	18 UJ		18 UJ					
RA_WG_SVOCs_EPHs	Benzoic acid	65-85-0	ug/l	18 UJ		18 UJ					
RA_WG_SVOCs_EPHs	Benzyl Alcohol	100-51-6	ug/l	14 UJ		14 U					
RA_WG_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Carbazole	86-74-8	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Dibenzofuran	132-64-9	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Diethyl Phthalate	84-66-2	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Hexachlorobenzene	118-74-1	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Hexachloroethane	67-72-1	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Isophorone	78-59-1	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Nitrobenzene	98-95-3	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	ug/l	7 UJ		7 U					
RA_WG_SVOCs_EPHs	Pentachlorophenol	87-86-5	ug/l	18 UJ		18 U					
RA_WG_SVOCs_EPHs	Phenol	108-95-2	ug/l	7 UJ		7 UJ					
RA_WG_SVOCs-SIM	1-Methylnaphthalene	90-12-0	ug/l	0.093 UJ		0.093 U					
RA_WG_SVOCs-SIM	2-Methylnaphthalene	91-57-6	ug/l	0.093 UJ		0.093 U					
RA_WG_SVOCs-SIM	Acenaphthene	83-32-9	ug/l	0.093 UJ		0.093 U					
RA_WG_SVOCs-SIM	Acenaphthylene	208-96-8	ug/l	0.093 UJ		0.093 U					
RA_WG_SVOCs-SIM	Anthracene	120-12-7	ug/l	0.093 UJ		0.093 U					
RA_WG_SVOCs-SIM	Benzo(a)anthracene	56-55-3	ug/l	0.093 UJ		0.0520 J					
RA_WG_SVOCs-SIM	Benzo(a)Pyrene	50-32-8	ug/l	0.093 UJ		0.0930 J					
RA_WG_SVOCs-SIM	Benzo(b)fluoranthene	205-99-2	ug/l	0.093 UJ		0.0950 J					
RA_WG_SVOCs-SIM	Benzo(g,h,i)Perylene	191-24-2	ug/l	0.093 UJ		0.0830 J					
RA_WG_SVOCs-SIM	Benzo(k)Fluoranthene	207-08-9	ug/l	0.093 UJ		0.0720 J					
RA_WG_SVOCs-SIM	Chrysene	218-01-9	ug/l	0.093 UJ		0.093 U					
RA_WG_SVOCs-SIM	Dibenzo(a,h)Anthracene	53-70-3	ug/l	0.093 UJ		0.093 U					
RA_WG_SVOCs-SIM	Fluoranthene	206-44-0	ug/l	0.093 UJ		0.0810 J					
RA_WG_SVOCs-SIM	Fluorene	86-73-7	ug/l	0.093 UJ		0.093 U					
RA_WG_SVOCs-SIM	Indeno(1,2,3-CD)Pyrene	193-39-5	ug/l	0.093 UJ		0.093 U					
RA_WG_SVOCs-SIM	Naphthalene	91-20-3	ug/l	0.093 UJ		0.093 U					
RA_WG_SVOCs-SIM	Phenanthrene	85-01-8	ug/l	0.093 UJ		0.093 U					
RA_WG_SVOCs-SIM	Pyrene	129-00-0	ug/l	0.093 UJ		0.093 U					
RA_WG_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U		
RA_WG_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U		
RA_WG_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U		
RA_WG_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U		
RA_WG_VOCs_VPHs	1,1-Dichloroethane	75-34-3	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.12 J	0.5 U		
RA_WG_VOCs_VPHs	1,1-Dichloroethene	75-35-4	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U		
RA_WG_VOCs_VPHs	1,1-Dichloropropene	563-58-6	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U		
RA_WG_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U		
RA_WG_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U		
RA_WG_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U		

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	MW-108S	OW-3	OW-3	OW-9	OW-9	OW-9	OW-9
				Sample Type Code	N	N	N	N	N	FD	FD
				Sample ID	MW-108S-CI19	OW-3-A	OW-3-CI19	OW-9-A	OW-9-AM	OW-99-A	OW-9-ADUP
				Sample Date	10/24/2019	7/23/2014	10/29/2019	7/23/2014	7/23/2014	7/23/2014	7/23/2014
				Depth Interval	12.36 - 12.36 ft	20.5 - 30.5 ft	9.65 - 9.65 ft	10 - 20 ft	10 - 20 ft	10 - 20 ft	10 - 20 ft
Method Analyte Group	Compound	CAS #	Units								
RA WG VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	0.75 U	20 U	0.75 U	2 U	0.25 U	2 U	
RA WG VOCs VPHs	1,2-Dibromoethane	106-93-4	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	1,2-Dichlorobenzene	95-50-1	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	1,2-Dichloroethane	107-06-2	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	1,2-Dichloropropane	78-87-5	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	1,3-Dichlorobenzene	541-73-1	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	1,3-Dichloropropane	142-28-9	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	1,4-Dichlorobenzene	106-46-7	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	2,2-Dichloropropane	594-20-7	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	2-Butanone (MEK)	78-93-3	ug/l	2.5 U	50 U	2.5 U	5 U	5 U	5 U	
RA WG VOCs VPHs	2-Chlorotoluene	95-49-8	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	2-Hexanone	591-78-6	ug/l	2.5 U	50 U	2.5 U	5 U	2.5 U	5 U	
RA WG VOCs VPHs	4-Chlorotoluene	106-43-4	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	4-Isopropyltoluene	99-87-6	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	4-Methyl-2-pentanone	108-10-1	ug/l	2.5 U	50 U	2.5 U	5 U	2.5 U	5 U	
RA WG VOCs VPHs	Acetone	67-64-1	ug/l	2.5 U	50 U	2.5 U	24.4	18 J	23.9	
RA WG VOCs VPHs	Benzene	71-43-2	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	Bromobenzene	108-86-1	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	Bromochloromethane	74-97-5	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.5 U	0.5 U	
RA WG VOCs VPHs	Bromodichloromethane	75-27-4	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	Bromoform	75-25-2	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	Bromomethane	74-83-9	ug/l	1 U	10 UJ	1 U	1 UJ	0.59 U	1 UJ	
RA WG VOCs VPHs	Carbon Disulfide	75-15-0	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	Carbon Tetrachloride	56-23-5	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	Chlorobenzene	108-90-7	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	Chloroethane	75-00-3	ug/l	1 U	10 UJ	1 U	1 UJ	0.25 U	1 UJ	
RA WG VOCs VPHs	Chloroform	67-66-3	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	Chloromethane	74-87-3	ug/l	1 U	5 U	1 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	ug/l	0.5 U	39.2 J	8.40	10.1 J	8	11.2 J	
RA WG VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	dibromochloromethane	124-48-1	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	Dibromomethane	74-95-3	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	Dichlorodifluoromethane	75-71-8	ug/l	1 U	10 U	1 U	1 U	0.25 U	1 U	
RA WG VOCs VPHs	Diisopropyl Ether	108-20-3	ug/l					0.25 U		
RA WG VOCs VPHs	Ethylbenzene	100-41-4	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	Freon 113	76-13-1	ug/l	0.5 U		0.5 U		0.25 U		
RA WG VOCs VPHs	Hexachlorobutadiene	87-68-3	ug/l	0.75 U	5 U	0.75 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	Hexane	110-54-3	ug/l					0.25 U		
RA WG VOCs VPHs	Isopropylbenzene	98-82-8	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	M,P-Xylenes	179601-23-1	ug/l	1 U	4 U	1 U	0.4 U	0.5 U	0.4 U	
RA WG VOCs VPHs	Methylene Chloride	75-09-2	ug/l	2.5 U	5 U	2.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	Naphthalene	91-20-3	ug/l		5 U		0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	n-Butylbenzene	104-51-8	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	n-Propylbenzene	103-65-1	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U	
RA WG VOCs VPHs	O-Xylene	95-47-6	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	sec-Butylbenzene	135-98-8	ug/l	0.5 U	2.8 J	1.10	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	Styrene	100-42-5	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	tert-Butylbenzene	98-06-6	ug/l	0.5 U	1.6 J	0.910 J	0.2 U	0.25 U	0.2 U	
RA WG VOCs VPHs	Tetrachloroethene	127-18-4	ug/l	1.50	5 U	1.40	0.4 J	0.37 J	0.4 J	
RA WG VOCs VPHs	Tetrahydrofuran	109-99-9	ug/l	5 U		5 U		2.5 U		
RA WG VOCs VPHs	Toluene	108-88-3	ug/l	0.5 U	2 U	0.5 U	0.2 U	0.25 U	0.2 U	

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	MW-108S	OW-3	OW-3	OW-9	OW-9	OW-9	OW-9
				Sample Type Code	N	N	N	N	N	FD	FD
				Sample ID	MW-108S-CI19	OW-3-A	OW-3-CI19	OW-9-A	OW-9-AM	OW-99-A	OW-9-ADUP
				Sample Date	10/24/2019	7/23/2014	10/29/2019	7/23/2014	7/23/2014	7/23/2014	7/23/2014
				Depth Interval	12.36 - 12.36 ft	20.5 - 30.5 ft	9.65 - 9.65 ft	10 - 20 ft	10 - 20 ft	10 - 20 ft	10 - 20 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_VOCs_VPHs	Xylenes, total (a)	1330-20-7	ug/l	1.5 U		1.5 U					
RA_WG_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	ug/l	1.5 U	6.0 U	1.5 U	0.60 U	0.75 U	0.60 U		
RA_WG_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	ug/l	0.5 U	5 U	0.5 U	0.5 U	0.25 U	0.5 U		
RA_WG_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.5 U	0.2 U	0.5 U	0.2 U	0.25 U	0.2 U		
RA_WG_VOCs_VPHs	Trichloroethylene	79-01-6	ug/l	1.40	134 J	46.0	4.8 J	4.4	5.4 J		
RA_WG_VOCs_VPHs	Trichlorofluoromethane	75-69-4	ug/l	1 U	5 U	1 U	0.5 U	0.25 U	0.5 U		
RA_WG_VOCs_VPHs	Vinyl Chloride	75-01-4	ug/l	1 U	5 U	1 U	0.5 U	0.25 U	0.5 U		

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	OW-9	TS-3-A	TS-3-A	TS-3-A	TS-3-B	TS-3-B	TS-3-B
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	OW-9-CI19	TS-3-A-MW2-1720	TS-3-A-MW3-2225	TS-3-A-MW4-2830	TS-3-B-MW1-1517	TS-3-B-MW3-2526	TS-3-B-MW4-3031
				Sample Date	10/22/2019	7/21/2014	7/21/2014	7/21/2014	7/21/2014	7/22/2014	7/22/2014
				Depth Interval	12.45 - 12.45 ft	17 - 20 ft	22 - 25 ft	28 - 30 ft	15 - 17 ft	25 - 26 ft	30 - 31 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_Metals	Aluminum	7429-90-5	ug/l	40 U							
RA_WG_Metals	Antimony	7440-36-0	ug/l	0.5 U							
RA_WG_Metals	Arsenic	7440-38-2	ug/l	3.00 J	0.7 J	10.8 J	3.6 J	0.5 J	3.2 J	5.9 J	
RA_WG_Metals	Barium	7440-39-3	ug/l	14.5	9.9 J	587	377	20.4 J	19.3 J	237	
RA_WG_Metals	Beryllium	7440-41-7	ug/l	0.2 U							
RA_WG_Metals	Cadmium	7440-43-9	ug/l	0.2 U	0.1 U	4.81	2.84	0.1 U	0.1 U	1.91	
RA_WG_Metals	Calcium	7440-70-2	ug/l	14400							
RA_WG_Metals	Chromium	7440-47-3	ug/l	4 U	3 U	63.3	63.5	24.1	33.4	276	
RA_WG_Metals	Cobalt	7440-48-4	ug/l	6.56							
RA_WG_Metals	Copper	7440-50-8	ug/l	2 U							
RA_WG_Metals	Iron	7439-89-6	ug/l	6450							
RA_WG_Metals	Lead	7439-92-1	ug/l	0.180 J	1 U	229	145	3	6.2	76.5	
RA_WG_Metals	Magnesium	7439-95-4	ug/l	2630							
RA_WG_Metals	Manganese	7439-96-5	ug/l	3180							
RA_WG_Metals	Mercury	7439-97-6	ug/l	0.1 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	
RA_WG_Metals	Nickel	7440-02-0	ug/l	2.60							
RA_WG_Metals	Potassium	7440-09-7	ug/l	3260							
RA_WG_Metals	Selenium	7782-49-2	ug/l	0.190 J	2 U	2 U	2 U	2 U	2 U	2 U	
RA_WG_Metals	Silver	7440-22-4	ug/l	0.4 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
RA_WG_Metals	Sodium	7440-23-5	ug/l	31700							
RA_WG_Metals	Thallium	7440-28-0	ug/l	0.4 U							
RA_WG_Metals	Vanadium	7440-62-2	ug/l	4 U							
RA_WG_Metals	Zinc	7440-66-6	ug/l	116							
RA_WG_Pest_PCBs	Aroclor 1016	12674-11-2	ug/l	0.23 UJ							
RA_WG_Pest_PCBs	Aroclor 1221	11104-28-2	ug/l	0.23 UJ							
RA_WG_Pest_PCBs	Aroclor 1232	11141-16-5	ug/l	0.23 UJ							
RA_WG_Pest_PCBs	Aroclor 1242	53469-21-9	ug/l	0.23 UJ							
RA_WG_Pest_PCBs	Aroclor 1248	12672-29-6	ug/l	0.23 UJ							
RA_WG_Pest_PCBs	Aroclor 1254	11097-69-1	ug/l	0.23 UJ							
RA_WG_Pest_PCBs	Aroclor 1260	11096-82-5	ug/l	0.23 UJ							
RA_WG_Pest_PCBs	PCB, Total (a)	1336-36-3	ug/l	1.6 UJ							
RA_WG_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	ug/l	1.6 U							
RA_WG_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	ug/l	7.1 UJ							
RA_WG_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	ug/l	18 U							
RA_WG_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	ug/l	18 U							
RA_WG_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	2-Chlorophenol	95-57-8	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	2-Methylphenol	95-48-7	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	2-Nitroaniline	88-74-4	ug/l	18 U							
RA_WG_SVOCs_EPHs	2-Nitrophenol	88-75-5	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	3-Nitroaniline	99-09-2	ug/l	18 U							
RA_WG_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	ug/l	18 U							
RA_WG_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	ug/l	7.1 U							

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	OW-9	TS-3-A	TS-3-A	TS-3-A	TS-3-B	TS-3-B	TS-3-B
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	OW-9-CI19	TS-3-A-MW2-1720	TS-3-A-MW3-2225	TS-3-A-MW4-2830	TS-3-B-MW1-1517	TS-3-B-MW3-2526	TS-3-B-MW4-3031
				Sample Date	10/22/2019	7/21/2014	7/21/2014	7/21/2014	7/21/2014	7/22/2014	7/22/2014
				Depth Interval	12.45 - 12.45 ft	17 - 20 ft	22 - 25 ft	28 - 30 ft	15 - 17 ft	25 - 26 ft	30 - 31 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_SVOCs_EPHs	4-Chloroaniline	106-47-8	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	4-Nitroaniline	100-01-6	ug/l	18 U							
RA_WG_SVOCs_EPHs	4-Nitrophenol	100-02-7	ug/l	18 UJ							
RA_WG_SVOCs_EPHs	Benzoic acid	65-85-0	ug/l	18 UJ							
RA_WG_SVOCs_EPHs	Benzyl Alcohol	100-51-6	ug/l	14 UJ							
RA_WG_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Carbazole	86-74-8	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Dibenzofuran	132-64-9	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Diethyl Phthalate	84-66-2	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Hexachlorobenzene	118-74-1	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Hexachloroethane	67-72-1	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Isophorone	78-59-1	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	Nitrobenzene	98-95-3	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	ug/l	7.1 UJ							
RA_WG_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	ug/l	7.1 U							
RA_WG_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	ug/l	7.1 UJ							
RA_WG_SVOCs_EPHs	Pentachlorophenol	87-86-5	ug/l	18 U							
RA_WG_SVOCs_EPHs	Phenol	108-95-2	ug/l	7.1 UJ							
RA_WG_SVOCs-SIM	1-Methylnaphthalene	90-12-0	ug/l	0.094 U							
RA_WG_SVOCs-SIM	2-Methylnaphthalene	91-57-6	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Acenaphthene	83-32-9	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Acenaphthylene	208-96-8	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Anthracene	120-12-7	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Benzo(a)anthracene	56-55-3	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Benzo(a)Pyrene	50-32-8	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Benzo(b)fluoranthene	205-99-2	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Benzo(g,h,i)Perylene	191-24-2	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Benzo(k)Fluoranthene	207-08-9	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Chrysene	218-01-9	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Dibenzo(a,h)Anthracene	53-70-3	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Fluoranthene	206-44-0	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Fluorene	86-73-7	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Indeno(1,2,3-CD)Pyrene	193-39-5	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Naphthalene	91-20-3	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Phenanthrene	85-01-8	ug/l	0.094 U							
RA_WG_SVOCs-SIM	Pyrene	129-00-0	ug/l	0.094 U							
RA_WG_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	ug/l	0.5 U	0.25 U	0.25 U	0.37 J	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	1,1-Dichloroethane	75-34-3	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	1,1-Dichloroethene	75-35-4	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.14 J	0.25 U	
RA_WG_VOCs_VPHs	1,1-Dichloropropene	563-58-6	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l	0.5 U	0.25 U	0.25 U	0.28 J	0.25 U	0.25 U	0.25 U	

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	OW-9	TS-3-A	TS-3-A	TS-3-A	TS-3-B	TS-3-B	TS-3-B
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	OW-9-CI19	TS-3-A-MW2-1720	TS-3-A-MW3-2225	TS-3-A-MW4-2830	TS-3-B-MW1-1517	TS-3-B-MW3-2526	TS-3-B-MW4-3031
				Sample Date	10/22/2019	7/21/2014	7/21/2014	7/21/2014	7/21/2014	7/22/2014	7/22/2014
				Depth Interval	12.45 - 12.45 ft	17 - 20 ft	22 - 25 ft	28 - 30 ft	15 - 17 ft	25 - 26 ft	30 - 31 ft
Method Analyte Group	Compound	CAS #	Units								
RA WG VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	ug/l	0.5 U	11	0.25 U	0.25 U	0.08 J	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	0.75 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dibromoethane	106-93-4	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dichlorobenzene	95-50-1	ug/l	0.5 U	0.25 U	0.25 U	0.22 J	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dichloroethane	107-06-2	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dichloropropane	78-87-5	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	ug/l	0.5 U	4.2	0.25 U	0.11 J	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,3-Dichlorobenzene	541-73-1	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,3-Dichloropropane	142-28-9	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,4-Dichlorobenzene	106-46-7	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	2,2-Dichloropropane	594-20-7	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	2-Butanone (MEK)	78-93-3	ug/l	2.5 U	5 U	5 U	5 U	5 U	5 U	5 U
RA WG VOCs VPHs	2-Chlorotoluene	95-49-8	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	2-Hexanone	591-78-6	ug/l	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
RA WG VOCs VPHs	4-Chlorotoluene	106-43-4	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	4-Isopropyltoluene	99-87-6	ug/l	0.5 U	0.87	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	4-Methyl-2-pentanone	108-10-1	ug/l	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U
RA WG VOCs VPHs	Acetone	67-64-1	ug/l	2.5 U	5 U	5 U	5 U	5 U	5 U	5 U
RA WG VOCs VPHs	Benzene	71-43-2	ug/l	0.5 U	0.28 J	0.25 U	0.15 J	0.25 U	0.25 U	0.1 J
RA WG VOCs VPHs	Bromobenzene	108-86-1	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Bromochloromethane	74-97-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Bromodichloromethane	75-27-4	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Bromoform	75-25-2	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Bromomethane	74-83-9	ug/l	1 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U
RA WG VOCs VPHs	Carbon Disulfide	75-15-0	ug/l	0.5 U	0.25 U	0.25 U	1	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Carbon Tetrachloride	56-23-5	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Chlorobenzene	108-90-7	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Chloroethane	75-00-3	ug/l	1 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Chloroform	67-66-3	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Chloromethane	74-87-3	ug/l	1 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	ug/l	0.720 J	9.5	0.25 U	0.13 J	2.3	1.5	0.38 J
RA WG VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	dibromochloromethane	124-48-1	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Dibromomethane	74-95-3	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Dichlorodifluoromethane	75-71-8	ug/l	1 U	1.2	0.25 U	0.25 U	2.9	0.25 U	0.25 U
RA WG VOCs VPHs	Diisopropyl Ether	108-20-3	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Ethylbenzene	100-41-4	ug/l	0.5 U	7.5	0.08 J	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Freon 113	76-13-1	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Hexachlorobutadiene	87-68-3	ug/l	0.75 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Hexane	110-54-3	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Isopropylbenzene	98-82-8	ug/l	0.5 U	4	0.25 U	0.25 U	0.25 U	0.18 J	0.25 U
RA WG VOCs VPHs	M,P-Xylenes	179601-23-1	ug/l	1 U	8.5	0.11 J	0.13 J	0.5 U	0.09 J	0.5 U
RA WG VOCs VPHs	Methylene Chloride	75-09-2	ug/l	2.5 U	0.16 J	0.25 U	0.17 J	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Naphthalene	91-20-3	ug/l		780	0.25 U	1 J	0.65 J	0.2 J	0.97 J
RA WG VOCs VPHs	n-Butylbenzene	104-51-8	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	n-Propylbenzene	103-65-1	ug/l	0.5 U	2.3	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	O-Xylene	95-47-6	ug/l	0.5 U	12	0.25 U	0.25 U	0.12 J	0.25 U	0.25 U
RA WG VOCs VPHs	sec-Butylbenzene	135-98-8	ug/l	0.810 J	0.25 U	3.4	0.25 U	1.4	0.56	0.25 U
RA WG VOCs VPHs	Styrene	100-42-5	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	tert-Butylbenzene	98-06-6	ug/l	0.480 J	0.44 J	1.2	0.27 J	0.45 J	0.2 J	0.38 J
RA WG VOCs VPHs	Tetrachloroethene	127-18-4	ug/l	0.5 U	1.5	0.14 J	0.14 J	0.6	0.13 J	0.25 U
RA WG VOCs VPHs	Tetrahydrofuran	109-99-9	ug/l	5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
RA WG VOCs VPHs	Toluene	108-88-3	ug/l	0.5 U	1	0.09 J	0.14 J	0.09 J	0.08 J	0.08 J

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	OW-9	TS-3-A	TS-3-A	TS-3-A	TS-3-B	TS-3-B	TS-3-B
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	OW-9-CI19	TS-3-A-MW2-1720	TS-3-A-MW3-2225	TS-3-A-MW4-2830	TS-3-B-MW1-1517	TS-3-B-MW3-2526	TS-3-B-MW4-3031
				Sample Date	10/22/2019	7/21/2014	7/21/2014	7/21/2014	7/21/2014	7/22/2014	7/22/2014
				Depth Interval	12.45 - 12.45 ft	17 - 20 ft	22 - 25 ft	28 - 30 ft	15 - 17 ft	25 - 26 ft	30 - 31 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_VOCs_VPHs	Xylenes, total (a)	1330-20-7	ug/l	1.5 U							
RA_WG_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	ug/l	1.5 U	21	0.36	0.38	0.62	0.34	0.75 U	
RA_WG_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	Trichloroethylene	79-01-6	ug/l	3.30	12	0.11 J	0.49 J	12	0.6 J	3.5 J	
RA_WG_VOCs_VPHs	Trichlorofluoromethane	75-69-4	ug/l	1 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	Vinyl Chloride	75-01-4	ug/l	1 U	2	0.25 U	0.25 U	1.2	0.25 U	0.25 U	

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	TS-3-B	TS-3-B	TS-3-B	TS-3-C	TS-3-C	TS-3-C	TS-3-C
				Sample Type Code	N	FD	FD	N	N	N	N
				Sample ID	TS-3-B-MW6-3940	DUP 01	DUP01	TS-3-C-MW1-1415	TS-3-C-MW2-1820	TS-3-C-MW3-2324	TS-3-C-MW5-2324
				Sample Date	7/21/2014	7/21/2014	7/21/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014
				Depth Interval	39 - 40 ft	39 - 40 ft	39 - 40 ft	14 - 15 ft	18 - 20 ft	23 - 24 ft	23 - 24 ft
Method Analyte Group	Compound	CAS #	Units								
RA WG Metals	Aluminum	7429-90-5	ug/l								
RA WG Metals	Antimony	7440-36-0	ug/l								
RA WG Metals	Arsenic	7440-38-2	ug/l	1 U	1 U		1 U	1.7 J	1 U		
RA WG Metals	Barium	7440-39-3	ug/l	24.5 J	25.9		12.5 J	39.9	12.1 J		
RA WG Metals	Beryllium	7440-41-7	ug/l								
RA WG Metals	Cadmium	7440-43-9	ug/l	0.1 U	0.1 U		0.12 J	0.1 U	0.1 U		
RA WG Metals	Calcium	7440-70-2	ug/l								
RA WG Metals	Chromium	7440-47-3	ug/l	3 U	3 U		3 UJ	60.8	16.8		
RA WG Metals	Cobalt	7440-48-4	ug/l								
RA WG Metals	Copper	7440-50-8	ug/l								
RA WG Metals	Iron	7439-89-6	ug/l								
RA WG Metals	Lead	7439-92-1	ug/l	1 J	1.6 J		1 UJ	5	2.6		
RA WG Metals	Magnesium	7439-95-4	ug/l								
RA WG Metals	Manganese	7439-96-5	ug/l								
RA WG Metals	Mercury	7439-97-6	ug/l	0.2 U	0.2 U		0.2 U	0.2 U	0.2 U		
RA WG Metals	Nickel	7440-02-0	ug/l								
RA WG Metals	Potassium	7440-09-7	ug/l								
RA WG Metals	Selenium	7782-49-2	ug/l	2 U	2 U		1.1 J	2 U	2 U		
RA WG Metals	Silver	7440-22-4	ug/l	0.1 U	0.1 U		0.13 J	0.1 U	0.1 U		
RA WG Metals	Sodium	7440-23-5	ug/l								
RA WG Metals	Thallium	7440-28-0	ug/l								
RA WG Metals	Vanadium	7440-62-2	ug/l								
RA WG Metals	Zinc	7440-66-6	ug/l								
RA WG Pest PCBs	Aroclor 1016	12674-11-2	ug/l								
RA WG Pest PCBs	Aroclor 1221	11104-28-2	ug/l								
RA WG Pest PCBs	Aroclor 1232	11141-16-5	ug/l								
RA WG Pest PCBs	Aroclor 1242	53469-21-9	ug/l								
RA WG Pest PCBs	Aroclor 1248	12672-29-6	ug/l								
RA WG Pest PCBs	Aroclor 1254	11097-69-1	ug/l								
RA WG Pest PCBs	Aroclor 1260	11096-82-5	ug/l								
RA WG Pest PCBs	PCB, Total (a)	1336-36-3	ug/l								
RA WG Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	ug/l								
RA WG SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l								
RA WG SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	ug/l								
RA WG SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	ug/l								
RA WG SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	ug/l								
RA WG SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	ug/l								
RA WG SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	ug/l								
RA WG SVOCs EPHs	2,4-Dichlorophenol	120-83-2	ug/l								
RA WG SVOCs EPHs	2,4-Dimethylphenol	105-67-9	ug/l								
RA WG SVOCs EPHs	2,4-Dinitrophenol	51-28-5	ug/l								
RA WG SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	ug/l								
RA WG SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	ug/l								
RA WG SVOCs EPHs	2-Chloronaphthalene	91-58-7	ug/l								
RA WG SVOCs EPHs	2-Chlorophenol	95-57-8	ug/l								
RA WG SVOCs EPHs	2-Methylphenol	95-48-7	ug/l								
RA WG SVOCs EPHs	2-Nitroaniline	88-74-4	ug/l								
RA WG SVOCs EPHs	2-Nitrophenol	88-75-5	ug/l								
RA WG SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	ug/l								
RA WG SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	ug/l								
RA WG SVOCs EPHs	3-Nitroaniline	99-09-2	ug/l								
RA WG SVOCs EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	ug/l								
RA WG SVOCs EPHs	4-Bromophenyl-Phenylether	101-55-3	ug/l								
RA WG SVOCs EPHs	4-Chloro-3-Methylphenol	59-50-7	ug/l								

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	TS-3-B	TS-3-B	TS-3-B	TS-3-C	TS-3-C	TS-3-C	TS-3-C
				Sample Type Code	N	FD	FD	N	N	N	N
				Sample ID	TS-3-B-MW6-3940	DUP 01	DUP01	TS-3-C-MW1-1415	TS-3-C-MW2-1820	TS-3-C-MW3-2324	TS-3-C-MW5-2324
				Sample Date	7/21/2014	7/21/2014	7/21/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014
				Depth Interval	39 - 40 ft	39 - 40 ft	39 - 40 ft	14 - 15 ft	18 - 20 ft	23 - 24 ft	23 - 24 ft
Method Analyte Group	Compound	CAS #	Units								
RA WG SVOCs EPHs	4-Chloroaniline	106-47-8	ug/l								
RA WG SVOCs EPHs	4-Chlorophenyl-Phenylether	7005-72-3	ug/l								
RA WG SVOCs EPHs	4-Nitroaniline	100-01-6	ug/l								
RA WG SVOCs EPHs	4-Nitrophenol	100-02-7	ug/l								
RA WG SVOCs EPHs	Benzoic acid	65-85-0	ug/l								
RA WG SVOCs EPHs	Benzyl Alcohol	100-51-6	ug/l								
RA WG SVOCs EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	ug/l								
RA WG SVOCs EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	ug/l								
RA WG SVOCs EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	ug/l								
RA WG SVOCs EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	ug/l								
RA WG SVOCs EPHs	Butyl Benzyl Phthalate	85-68-7	ug/l								
RA WG SVOCs EPHs	Carbazole	86-74-8	ug/l								
RA WG SVOCs EPHs	Dibenzofuran	132-64-9	ug/l								
RA WG SVOCs EPHs	Diethyl Phthalate	84-66-2	ug/l								
RA WG SVOCs EPHs	Dimethyl Phthalate	131-11-3	ug/l								
RA WG SVOCs EPHs	Di-n-Butyl Phthalate	84-74-2	ug/l								
RA WG SVOCs EPHs	Di-n-Octyl Phthalate	117-84-0	ug/l								
RA WG SVOCs EPHs	Hexachlorobenzene	118-74-1	ug/l								
RA WG SVOCs EPHs	Hexachloroethane	67-72-1	ug/l								
RA WG SVOCs EPHs	Isophorone	78-59-1	ug/l								
RA WG SVOCs EPHs	Nitrobenzene	98-95-3	ug/l								
RA WG SVOCs EPHs	n-Nitroso-Di-Methylamine	62-75-9	ug/l								
RA WG SVOCs EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	ug/l								
RA WG SVOCs EPHs	n-Nitroso-Di-Phenylamine	86-30-6	ug/l								
RA WG SVOCs EPHs	Pentachlorophenol	87-86-5	ug/l								
RA WG SVOCs EPHs	Phenol	108-95-2	ug/l								
RA WG SVOCs-SIM	1-Methylnaphthalene	90-12-0	ug/l								
RA WG SVOCs-SIM	2-Methylnaphthalene	91-57-6	ug/l								
RA WG SVOCs-SIM	Acenaphthene	83-32-9	ug/l								
RA WG SVOCs-SIM	Acenaphthylene	208-96-8	ug/l								
RA WG SVOCs-SIM	Anthracene	120-12-7	ug/l								
RA WG SVOCs-SIM	Benzo(a)anthracene	56-55-3	ug/l								
RA WG SVOCs-SIM	Benzo(a)Pyrene	50-32-8	ug/l								
RA WG SVOCs-SIM	Benzo(b)fluoranthene	205-99-2	ug/l								
RA WG SVOCs-SIM	Benzo(g,h,i)Perylene	191-24-2	ug/l								
RA WG SVOCs-SIM	Benzo(k)Fluoranthene	207-08-9	ug/l								
RA WG SVOCs-SIM	Chrysene	218-01-9	ug/l								
RA WG SVOCs-SIM	Dibenzo(a,h)Anthracene	53-70-3	ug/l								
RA WG SVOCs-SIM	Fluoranthene	206-44-0	ug/l								
RA WG SVOCs-SIM	Fluorene	86-73-7	ug/l								
RA WG SVOCs-SIM	Indeno(1,2,3-CD)Pyrene	193-39-5	ug/l								
RA WG SVOCs-SIM	Naphthalene	91-20-3	ug/l								
RA WG SVOCs-SIM	Phenanthrene	85-01-8	ug/l								
RA WG SVOCs-SIM	Pyrene	129-00-0	ug/l								
RA WG VOCs VPHs	1,1,1,2-Tetrachloroethane	630-20-6	ug/l		0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,1,1-Trichloroethane	71-55-6	ug/l		0.25 U		0.25 U	0.17 J	0.25 U		0.25 U
RA WG VOCs VPHs	1,1,2,2-Tetrachloroethane	79-34-5	ug/l		0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,1,2-Trichloroethane	79-00-5	ug/l		0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,1-Dichloroethane	75-34-3	ug/l		0.25 U		0.25 U	0.13 J	0.29 J		0.25 U
RA WG VOCs VPHs	1,1-Dichloroethene	75-35-4	ug/l		0.22 J		0.26 J	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,1-Dichloropropene	563-58-6	ug/l		0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,2,3-Trichlorobenzene	87-61-6	ug/l		0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,2,3-Trichloropropane	96-18-4	ug/l		0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l		0.25 U		0.25 U	0.25 U	0.25 U		0.25 U

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	TS-3-B	TS-3-B	TS-3-B	TS-3-C	TS-3-C	TS-3-C	TS-3-C
				Sample Type Code	N	FD	FD	N	N	N	N
				Sample ID	TS-3-B-MW6-3940	DUP 01	DUP01	TS-3-C-MW1-1415	TS-3-C-MW2-1820	TS-3-C-MW3-2324	TS-3-C-MW5-2324
				Sample Date	7/21/2014	7/21/2014	7/21/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014
				Depth Interval	39 - 40 ft	39 - 40 ft	39 - 40 ft	14 - 15 ft	18 - 20 ft	23 - 24 ft	23 - 24 ft
Method Analyte Group	Compound	CAS #	Units								
RA WG VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	ug/l	0.25 U		0.25 U	0.25 U	0.14 J		0.25 U
RA WG VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,2-Dibromoethane	106-93-4	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,2-Dichlorobenzene	95-50-1	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,2-Dichloroethane	107-06-2	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,2-Dichloropropane	78-87-5	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,3-Dichlorobenzene	541-73-1	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,3-Dichloropropane	142-28-9	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	1,4-Dichlorobenzene	106-46-7	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	2,2-Dichloropropane	594-20-7	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	2-Butanone (MEK)	78-93-3	ug/l	5 U		5 U	5 U	5 U		5 U
RA WG VOCs VPHs	2-Chlorotoluene	95-49-8	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	2-Hexanone	591-78-6	ug/l	2.5 U		2.5 U	2.5 U	2.5 U		2.5 U
RA WG VOCs VPHs	4-Chlorotoluene	106-43-4	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	4-Isopropyltoluene	99-87-6	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	4-Methyl-2-pentanone	108-10-1	ug/l	2.5 UJ		2.5 UJ	2.5 U	2.5 U		2.5 U
RA WG VOCs VPHs	Acetone	67-64-1	ug/l	5 U		5 U	5 U	5 U		5 U
RA WG VOCs VPHs	Benzene	71-43-2	ug/l	0.25 U		0.25 U	0.25 U	0.18 J		0.25 U
RA WG VOCs VPHs	Bromobenzene	108-86-1	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Bromochloromethane	74-97-5	ug/l	0.5 U		0.5 U	0.5 U	0.5 U		0.5 U
RA WG VOCs VPHs	Bromodichloromethane	75-27-4	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Bromoform	75-25-2	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Bromomethane	74-83-9	ug/l	0.59 U		0.59 U	0.59 U	0.59 U		0.59 U
RA WG VOCs VPHs	Carbon Disulfide	75-15-0	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Carbon Tetrachloride	56-23-5	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Chlorobenzene	108-90-7	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Chloroethane	75-00-3	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Chloroform	67-66-3	ug/l	0.25 U		0.25 U	0.13 J	0.1 J		0.25 U
RA WG VOCs VPHs	Chloromethane	74-87-3	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	ug/l	0.9		0.89	1.7	2.7		2.2
RA WG VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	dibromochloromethane	124-48-1	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Dibromomethane	74-95-3	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Dichlorodifluoromethane	75-71-8	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Diisopropyl Ether	108-20-3	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Ethylbenzene	100-41-4	ug/l	0.25 U		0.25 U	0.25 U	0.09 J		0.25 U
RA WG VOCs VPHs	Freon 113	76-13-1	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Hexachlorobutadiene	87-68-3	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Hexane	110-54-3	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Isopropylbenzene	98-82-8	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	M,P-Xylenes	179601-23-1	ug/l	0.5 U		0.5 U	0.5 U	0.22 J		0.5 U
RA WG VOCs VPHs	Methylene Chloride	75-09-2	ug/l	0.25 U		0.25 U	0.25 U	0.17 J		0.25 J
RA WG VOCs VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Naphthalene	91-20-3	ug/l	1.8 J		1.1 J	0.25 U	0.18 J		0.25 U
RA WG VOCs VPHs	n-Butylbenzene	104-51-8	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	n-Propylbenzene	103-65-1	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	O-Xylene	95-47-6	ug/l	0.25 U		0.25 U	0.25 U	0.09 J		0.25 U
RA WG VOCs VPHs	sec-Butylbenzene	135-98-8	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Styrene	100-42-5	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	tert-Butylbenzene	98-06-6	ug/l	0.31 J		0.34 J	0.25 U	0.25 U		0.25 U
RA WG VOCs VPHs	Tetrachloroethene	127-18-4	ug/l	0.25 U		0.25 U	0.61	0.23 J		0.18 J
RA WG VOCs VPHs	Tetrahydrofuran	109-99-9	ug/l	2.5 U		2.5 U	2.5 U	2.5 U		2.5 U
RA WG VOCs VPHs	Toluene	108-88-3	ug/l	0.25 U		0.25 U	0.11 J	0.24 J		0.09 J

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	TS-3-B	TS-3-B	TS-3-B	TS-3-C	TS-3-C	TS-3-C	TS-3-C
				Sample Type Code	N	FD	FD	N	N	N	N
				Sample ID	TS-3-B-MW6-3940	DUP 01	DUP01	TS-3-C-MW1-1415	TS-3-C-MW2-1820	TS-3-C-MW3-2324	TS-3-C-MW5-2324
				Sample Date	7/21/2014	7/21/2014	7/21/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014
				Depth Interval	39 - 40 ft	39 - 40 ft	39 - 40 ft	14 - 15 ft	18 - 20 ft	23 - 24 ft	23 - 24 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_VOCs_VPHs	Xylenes, total (a)	1330-20-7	ug/l								
RA_WG_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	ug/l	0.75 U		0.75 U	0.75 U	0.31		0.75 U
RA_WG_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	ug/l	0.15 J		0.15 J	0.25 U	0.25 U		0.25 U
RA_WG_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA_WG_VOCs_VPHs	Trichloroethylene	79-01-6	ug/l	5.2		4.9	74 J	21 J		11 J
RA_WG_VOCs_VPHs	Trichlorofluoromethane	75-69-4	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U
RA_WG_VOCs_VPHs	Vinyl Chloride	75-01-4	ug/l	0.25 U		0.25 U	0.25 U	0.25 U		0.25 U

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	TS-3-C	TS-3-D	TS-3-D	TS-UP-1	TS-UP-1	TS-UP-1	TS-UP-1
				Sample Type Code	FD	N	N	N	N	N	N
				Sample ID	TS-3-C-MW1-1415DUP	TS-3-D-MW1-1315	TS-3-D-MW2-1921	TS-UP-1-MW1-1316	TS-UP-1-MW2-1821	TS-UP-1-MW4-2427	TS-UP-1-MW5-3033
				Sample Date	7/22/2014	8/5/2014	8/5/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014
				Depth Interval	14 - 15 ft	13 - 15 ft	19 - 21 ft	13 - 16 ft	18 - 21 ft	27 - 27 ft	30 - 33 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_Metals	Aluminum	7429-90-5	ug/l								
RA_WG_Metals	Antimony	7440-36-0	ug/l								
RA_WG_Metals	Arsenic	7440-38-2	ug/l	1 U	3 U	3 U	1 U	1 U	0.6 J		
RA_WG_Metals	Barium	7440-39-3	ug/l	12.8 J	20.6 J	43.5 J	18.6 J	17.5 J	27.3 J		
RA_WG_Metals	Beryllium	7440-41-7	ug/l								
RA_WG_Metals	Cadmium	7440-43-9	ug/l	0.03 J	0.5 U	0.5 U	0.05 J	0.05 J	0.17 J		
RA_WG_Metals	Calcium	7440-70-2	ug/l								
RA_WG_Metals	Chromium	7440-47-3	ug/l	3 U	1.5 J	3 U	3 J	3.2 J	26.2 J		
RA_WG_Metals	Cobalt	7440-48-4	ug/l								
RA_WG_Metals	Copper	7440-50-8	ug/l								
RA_WG_Metals	Iron	7439-89-6	ug/l								
RA_WG_Metals	Lead	7439-92-1	ug/l	1 U	3.4 J	2.6 J	0.7 J	1 UJ	4.2 J		
RA_WG_Metals	Magnesium	7439-95-4	ug/l								
RA_WG_Metals	Manganese	7439-96-5	ug/l								
RA_WG_Metals	Mercury	7439-97-6	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U		
RA_WG_Metals	Nickel	7440-02-0	ug/l								
RA_WG_Metals	Potassium	7440-09-7	ug/l								
RA_WG_Metals	Selenium	7782-49-2	ug/l	0.9 J	6 U	6 U	2 U	2 U	2 U		
RA_WG_Metals	Silver	7440-22-4	ug/l	0.1 UJ	0.3 U	0.3 U	0.1 UJ	0.1 UJ	0.1 UJ		
RA_WG_Metals	Sodium	7440-23-5	ug/l								
RA_WG_Metals	Thallium	7440-28-0	ug/l								
RA_WG_Metals	Vanadium	7440-62-2	ug/l								
RA_WG_Metals	Zinc	7440-66-6	ug/l								
RA_WG_Pest_PCBs	Aroclor 1016	12674-11-2	ug/l								
RA_WG_Pest_PCBs	Aroclor 1221	11104-28-2	ug/l								
RA_WG_Pest_PCBs	Aroclor 1232	11141-16-5	ug/l								
RA_WG_Pest_PCBs	Aroclor 1242	53469-21-9	ug/l								
RA_WG_Pest_PCBs	Aroclor 1248	12672-29-6	ug/l								
RA_WG_Pest_PCBs	Aroclor 1254	11097-69-1	ug/l								
RA_WG_Pest_PCBs	Aroclor 1260	11096-82-5	ug/l								
RA_WG_Pest_PCBs	PCB, Total (a)	1336-36-3	ug/l								
RA_WG_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	ug/l								
RA_WG_SVOCs_EPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l								
RA_WG_SVOCs_EPHs	1,2-Dichlorobenzene	95-50-1	ug/l								
RA_WG_SVOCs_EPHs	1,3-Dichlorobenzene	541-73-1	ug/l								
RA_WG_SVOCs_EPHs	1,4-Dichlorobenzene	106-46-7	ug/l								
RA_WG_SVOCs_EPHs	2,4,5-Trichlorophenol	95-95-4	ug/l								
RA_WG_SVOCs_EPHs	2,4,6-Trichlorophenol	88-06-2	ug/l								
RA_WG_SVOCs_EPHs	2,4-Dichlorophenol	120-83-2	ug/l								
RA_WG_SVOCs_EPHs	2,4-Dimethylphenol	105-67-9	ug/l								
RA_WG_SVOCs_EPHs	2,4-Dinitrophenol	51-28-5	ug/l								
RA_WG_SVOCs_EPHs	2,4-Dinitrotoluene	121-14-2	ug/l								
RA_WG_SVOCs_EPHs	2,6-Dinitrotoluene	606-20-2	ug/l								
RA_WG_SVOCs_EPHs	2-Chloronaphthalene	91-58-7	ug/l								
RA_WG_SVOCs_EPHs	2-Chlorophenol	95-57-8	ug/l								
RA_WG_SVOCs_EPHs	2-Methylphenol	95-48-7	ug/l								
RA_WG_SVOCs_EPHs	2-Nitroaniline	88-74-4	ug/l								
RA_WG_SVOCs_EPHs	2-Nitrophenol	88-75-5	ug/l								
RA_WG_SVOCs_EPHs	3&4-Methylphenol	3&4-Mphenol	ug/l								
RA_WG_SVOCs_EPHs	3,3'-Dichlorobenzidine	91-94-1	ug/l								
RA_WG_SVOCs_EPHs	3-Nitroaniline	99-09-2	ug/l								
RA_WG_SVOCs_EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	ug/l								
RA_WG_SVOCs_EPHs	4-Bromophenyl-Phenylether	101-55-3	ug/l								
RA_WG_SVOCs_EPHs	4-Chloro-3-Methylphenol	59-50-7	ug/l								

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	TS-3-C	TS-3-D	TS-3-D	TS-UP-1	TS-UP-1	TS-UP-1	TS-UP-1
				Sample Type Code	FD	N	N	N	N	N	N
				Sample ID	TS-3-C-MW1-1415DUP	TS-3-D-MW1-1315	TS-3-D-MW2-1921	TS-UP-1-MW1-1316	TS-UP-1-MW2-1821	TS-UP-1-MW4-2427	TS-UP-1-MW5-3033
				Sample Date	7/22/2014	8/5/2014	8/5/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014
				Depth Interval	14 - 15 ft	13 - 15 ft	19 - 21 ft	13 - 16 ft	18 - 21 ft	27 - 27 ft	30 - 33 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_SVOCs_EPHs	4-Chloroaniline	106-47-8	ug/l								
RA_WG_SVOCs_EPHs	4-Chlorophenyl-Phenylether	7005-72-3	ug/l								
RA_WG_SVOCs_EPHs	4-Nitroaniline	100-01-6	ug/l								
RA_WG_SVOCs_EPHs	4-Nitrophenol	100-02-7	ug/l								
RA_WG_SVOCs_EPHs	Benzoic acid	65-85-0	ug/l								
RA_WG_SVOCs_EPHs	Benzyl Alcohol	100-51-6	ug/l								
RA_WG_SVOCs_EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	ug/l								
RA_WG_SVOCs_EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	ug/l								
RA_WG_SVOCs_EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	ug/l								
RA_WG_SVOCs_EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	ug/l								
RA_WG_SVOCs_EPHs	Butyl Benzyl Phthalate	85-68-7	ug/l								
RA_WG_SVOCs_EPHs	Carbazole	86-74-8	ug/l								
RA_WG_SVOCs_EPHs	Dibenzofuran	132-64-9	ug/l								
RA_WG_SVOCs_EPHs	Diethyl Phthalate	84-66-2	ug/l								
RA_WG_SVOCs_EPHs	Dimethyl Phthalate	131-11-3	ug/l								
RA_WG_SVOCs_EPHs	Di-n-Butyl Phthalate	84-74-2	ug/l								
RA_WG_SVOCs_EPHs	Di-n-Octyl Phthalate	117-84-0	ug/l								
RA_WG_SVOCs_EPHs	Hexachlorobenzene	118-74-1	ug/l								
RA_WG_SVOCs_EPHs	Hexachloroethane	67-72-1	ug/l								
RA_WG_SVOCs_EPHs	Isophorone	78-59-1	ug/l								
RA_WG_SVOCs_EPHs	Nitrobenzene	98-95-3	ug/l								
RA_WG_SVOCs_EPHs	n-Nitroso-Di-Methylamine	62-75-9	ug/l								
RA_WG_SVOCs_EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	ug/l								
RA_WG_SVOCs_EPHs	n-Nitroso-Di-Phenylamine	86-30-6	ug/l								
RA_WG_SVOCs_EPHs	Pentachlorophenol	87-86-5	ug/l								
RA_WG_SVOCs_EPHs	Phenol	108-95-2	ug/l								
RA_WG_SVOCs-SIM	1-Methylnaphthalene	90-12-0	ug/l								
RA_WG_SVOCs-SIM	2-Methylnaphthalene	91-57-6	ug/l								
RA_WG_SVOCs-SIM	Acenaphthene	83-32-9	ug/l								
RA_WG_SVOCs-SIM	Acenaphthylene	208-96-8	ug/l								
RA_WG_SVOCs-SIM	Anthracene	120-12-7	ug/l								
RA_WG_SVOCs-SIM	Benzo(a)anthracene	56-55-3	ug/l								
RA_WG_SVOCs-SIM	Benzo(a)Pyrene	50-32-8	ug/l								
RA_WG_SVOCs-SIM	Benzo(b)fluoranthene	205-99-2	ug/l								
RA_WG_SVOCs-SIM	Benzo(g,h,i)Perylene	191-24-2	ug/l								
RA_WG_SVOCs-SIM	Benzo(k)Fluoranthene	207-08-9	ug/l								
RA_WG_SVOCs-SIM	Chrysene	218-01-9	ug/l								
RA_WG_SVOCs-SIM	Dibenzo(a,h)Anthracene	53-70-3	ug/l								
RA_WG_SVOCs-SIM	Fluoranthene	206-44-0	ug/l								
RA_WG_SVOCs-SIM	Fluorene	86-73-7	ug/l								
RA_WG_SVOCs-SIM	Indeno(1,2,3-CD)Pyrene	193-39-5	ug/l								
RA_WG_SVOCs-SIM	Naphthalene	91-20-3	ug/l								
RA_WG_SVOCs-SIM	Phenanthrene	85-01-8	ug/l								
RA_WG_SVOCs-SIM	Pyrene	129-00-0	ug/l								
RA_WG_VOCs_VPHs	1,1,1,2-Tetrachloroethane	630-20-6	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA_WG_VOCs_VPHs	1,1,1-Trichloroethane	71-55-6	ug/l		0.19 J	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA_WG_VOCs_VPHs	1,1,2,2-Tetrachloroethane	79-34-5	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA_WG_VOCs_VPHs	1,1,2-Trichloroethane	79-00-5	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA_WG_VOCs_VPHs	1,1-Dichloroethane	75-34-3	ug/l		0.26 J	3.2	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA_WG_VOCs_VPHs	1,1-Dichloroethene	75-35-4	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA_WG_VOCs_VPHs	1,1-Dichloropropene	563-58-6	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA_WG_VOCs_VPHs	1,2,3-Trichlorobenzene	87-61-6	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA_WG_VOCs_VPHs	1,2,3-Trichloropropane	96-18-4	ug/l		0.25 UJ	0.25 UJ	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA_WG_VOCs_VPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	TS-3-C	TS-3-D	TS-3-D	TS-UP-1	TS-UP-1	TS-UP-1	TS-UP-1
				Sample Type Code	FD	N	N	N	N	N	N
				Sample ID	TS-3-C-MW1-1415DUP	TS-3-D-MW1-1315	TS-3-D-MW2-1921	TS-UP-1-MW1-1316	TS-UP-1-MW2-1821	TS-UP-1-MW4-2427	TS-UP-1-MW5-3033
				Sample Date	7/22/2014	8/5/2014	8/5/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014
				Depth Interval	14 - 15 ft	13 - 15 ft	19 - 21 ft	13 - 16 ft	18 - 21 ft	27 - 27 ft	30 - 33 ft
Method Analyte Group	Compound	CAS #	Units								
RA WG VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dibromoethane	106-93-4	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dichlorobenzene	95-50-1	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dichloroethane	107-06-2	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dichloropropane	78-87-5	ug/l		0.94	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,3-Dichlorobenzene	541-73-1	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,3-Dichloropropane	142-28-9	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,4-Dichlorobenzene	106-46-7	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	2,2-Dichloropropane	594-20-7	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	2-Butanone (MEK)	78-93-3	ug/l		5 U	5 U	5 U	5 U	5 U	5 U	5 U
RA WG VOCs VPHs	2-Chlorotoluene	95-49-8	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	2-Hexanone	591-78-6	ug/l		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
RA WG VOCs VPHs	4-Chlorotoluene	106-43-4	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	4-Isopropyltoluene	99-87-6	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	4-Methyl-2-pentanone	108-10-1	ug/l		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
RA WG VOCs VPHs	Acetone	67-64-1	ug/l		5 U	5 U	5 U	5 U	5 U	5 U	5 U
RA WG VOCs VPHs	Benzene	71-43-2	ug/l		0.25 U	0.12 J	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Bromobenzene	108-86-1	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Bromochloromethane	74-97-5	ug/l		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Bromodichloromethane	75-27-4	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Bromoform	75-25-2	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Bromomethane	74-83-9	ug/l		0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U
RA WG VOCs VPHs	Carbon Disulfide	75-15-0	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Carbon Tetrachloride	56-23-5	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Chlorobenzene	108-90-7	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Chloroethane	75-00-3	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Chloroform	67-66-3	ug/l		0.19 J	0.63	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Chloromethane	74-87-3	ug/l		0.25 U	0.51 J	0.25 U	0.25 U	0.25 U	0.25 U	0.47 J
RA WG VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	ug/l		1.7	39	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	dibromochloromethane	124-48-1	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Dibromomethane	74-95-3	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Dichlorodifluoromethane	75-71-8	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Diisopropyl Ether	108-20-3	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Ethylbenzene	100-41-4	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Freon 113	76-13-1	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Hexachlorobutadiene	87-68-3	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Hexane	110-54-3	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Isopropylbenzene	98-82-8	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.11 J	0.25 U
RA WG VOCs VPHs	M,P-Xylenes	179601-23-1	ug/l		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Methylene Chloride	75-09-2	ug/l		0.25 U	0.26 J	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Naphthalene	91-20-3	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.19 J
RA WG VOCs VPHs	n-Butylbenzene	104-51-8	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.21 J	0.25 U
RA WG VOCs VPHs	n-Propylbenzene	103-65-1	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	O-Xylene	95-47-6	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	sec-Butylbenzene	135-98-8	ug/l		0.25 U	0.25 U	0.25 U	0.78	2	1.5	
RA WG VOCs VPHs	Styrene	100-42-5	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	tert-Butylbenzene	98-06-6	ug/l		0.25 U	0.25 U	0.25 U	0.39 J	1.2	1.1	
RA WG VOCs VPHs	Tetrachloroethene	127-18-4	ug/l		1.8	3.7	0.22 J	0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Tetrahydrofuran	109-99-9	ug/l		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
RA WG VOCs VPHs	Toluene	108-88-3	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.16 J

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	TS-3-C	TS-3-D	TS-3-D	TS-UP-1	TS-UP-1	TS-UP-1	TS-UP-1
				Sample Type Code	FD	N	N	N	N	N	N
				Sample ID	TS-3-C-MW1-1415DUP	TS-3-D-MW1-1315	TS-3-D-MW2-1921	TS-UP-1-MW1-1316	TS-UP-1-MW2-1821	TS-UP-1-MW4-2427	TS-UP-1-MW5-3033
				Sample Date	7/22/2014	8/5/2014	8/5/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014
				Depth Interval	14 - 15 ft	13 - 15 ft	19 - 21 ft	13 - 16 ft	18 - 21 ft	27 - 27 ft	30 - 33 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_VOCs_VPHs	Xylenes, total (a)	1330-20-7	ug/l								
RA_WG_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	ug/l		0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	
RA_WG_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	ug/l		0.25 U	0.41 J	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	Trichloroethylene	79-01-6	ug/l		75	180	1.4	0.25 U	0.25 U	0.43 J	
RA_WG_VOCs_VPHs	Trichlorofluoromethane	75-69-4	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	Vinyl Chloride	75-01-4	ug/l		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	TS-UP-1	TS-UP-1	TS-UP-1	TS-UP-1	TS-UP-2	TS-UP-2	TS-UP-2
				Sample Type Code	N	FD	FD	FD	N	N	N
				Sample ID	TS-UP-1-MW6-3940	DUP 02	DUP-02	TS-UP-1-MW6-3940DUP	TS-UP-2-MW3-2225	TS-UP-2-MW1-1316	TS-UP-2-MW2-1821
				Sample Date	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/24/2014	7/24/2014
				Depth Interval	39 - 40 ft	39 - 40 ft	39 - 40 ft	39 - 40 ft	22 - 25 ft	13 - 16 ft	18 - 21 ft
Method Analyte Group	Compound	CAS #	Units								
RA WG Metals	Aluminum	7429-90-5	ug/l								
RA WG Metals	Antimony	7440-36-0	ug/l								
RA WG Metals	Arsenic	7440-38-2	ug/l	6.4 J	4.9 J		5.9	1 U	1 U	0.7 J	
RA WG Metals	Barium	7440-39-3	ug/l	922 J	726 J		908	25.4 J	17.2 J	24.1 J	
RA WG Metals	Beryllium	7440-41-7	ug/l								
RA WG Metals	Cadmium	7440-43-9	ug/l	4.24 J	3.25 J		4.27	0.09 J	0.18	0.07 J	
RA WG Metals	Calcium	7440-70-2	ug/l								
RA WG Metals	Chromium	7440-47-3	ug/l	606 J	630 J		637	19.4 J	3 U	39.7	
RA WG Metals	Cobalt	7440-48-4	ug/l								
RA WG Metals	Copper	7440-50-8	ug/l								
RA WG Metals	Iron	7439-89-6	ug/l								
RA WG Metals	Lead	7439-92-1	ug/l	304 J	216 J		305	1 UJ	0.7 J	2.2 J	
RA WG Metals	Magnesium	7439-95-4	ug/l								
RA WG Metals	Manganese	7439-96-5	ug/l								
RA WG Metals	Mercury	7439-97-6	ug/l	0.2 U	0.2 U		0.2 U	0.2 U	0.2 U	0.2 U	
RA WG Metals	Nickel	7440-02-0	ug/l								
RA WG Metals	Potassium	7440-09-7	ug/l								
RA WG Metals	Selenium	7782-49-2	ug/l	2 U	2 U		2 U	2 U	2 U	2 U	
RA WG Metals	Silver	7440-22-4	ug/l	0.1 UJ	0.1 UJ		0.1 U	0.1 UJ	0.1 U	0.1 U	
RA WG Metals	Sodium	7440-23-5	ug/l								
RA WG Metals	Thallium	7440-28-0	ug/l								
RA WG Metals	Vanadium	7440-62-2	ug/l								
RA WG Metals	Zinc	7440-66-6	ug/l								
RA WG Pest PCBs	Aroclor 1016	12674-11-2	ug/l								
RA WG Pest PCBs	Aroclor 1221	11104-28-2	ug/l								
RA WG Pest PCBs	Aroclor 1232	11141-16-5	ug/l								
RA WG Pest PCBs	Aroclor 1242	53469-21-9	ug/l								
RA WG Pest PCBs	Aroclor 1248	12672-29-6	ug/l								
RA WG Pest PCBs	Aroclor 1254	11097-69-1	ug/l								
RA WG Pest PCBs	Aroclor 1260	11096-82-5	ug/l								
RA WG Pest PCBs	PCB, Total (a)	1336-36-3	ug/l								
RA WG Pest PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	ug/l								
RA WG SVOCs EPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l								
RA WG SVOCs EPHs	1,2-Dichlorobenzene	95-50-1	ug/l								
RA WG SVOCs EPHs	1,3-Dichlorobenzene	541-73-1	ug/l								
RA WG SVOCs EPHs	1,4-Dichlorobenzene	106-46-7	ug/l								
RA WG SVOCs EPHs	2,4,5-Trichlorophenol	95-95-4	ug/l								
RA WG SVOCs EPHs	2,4,6-Trichlorophenol	88-06-2	ug/l								
RA WG SVOCs EPHs	2,4-Dichlorophenol	120-83-2	ug/l								
RA WG SVOCs EPHs	2,4-Dimethylphenol	105-67-9	ug/l								
RA WG SVOCs EPHs	2,4-Dinitrophenol	51-28-5	ug/l								
RA WG SVOCs EPHs	2,4-Dinitrotoluene	121-14-2	ug/l								
RA WG SVOCs EPHs	2,6-Dinitrotoluene	606-20-2	ug/l								
RA WG SVOCs EPHs	2-Chloronaphthalene	91-58-7	ug/l								
RA WG SVOCs EPHs	2-Chlorophenol	95-57-8	ug/l								
RA WG SVOCs EPHs	2-Methylphenol	95-48-7	ug/l								
RA WG SVOCs EPHs	2-Nitroaniline	88-74-4	ug/l								
RA WG SVOCs EPHs	2-Nitrophenol	88-75-5	ug/l								
RA WG SVOCs EPHs	3&4-Methylphenol	3&4-Mphenol	ug/l								
RA WG SVOCs EPHs	3,3'-Dichlorobenzidine	91-94-1	ug/l								
RA WG SVOCs EPHs	3-Nitroaniline	99-09-2	ug/l								
RA WG SVOCs EPHs	4,6-Dinitro-2-Methylphenol	534-52-1	ug/l								
RA WG SVOCs EPHs	4-Bromophenyl-Phenylether	101-55-3	ug/l								
RA WG SVOCs EPHs	4-Chloro-3-Methylphenol	59-50-7	ug/l								

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	TS-UP-1	TS-UP-1	TS-UP-1	TS-UP-1	TS-UP-2	TS-UP-2	TS-UP-2
				Sample Type Code	N	FD	FD	FD	N	N	N
				Sample ID	TS-UP-1-MW6-3940	DUP 02	DUP-02	TS-UP-1-MW6-3940DUP	TS-UP-2-MW3-2225	TS-UP-2-MW1-1316	TS-UP-2-MW2-1821
				Sample Date	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/24/2014	7/24/2014
				Depth Interval	39 - 40 ft	39 - 40 ft	39 - 40 ft	39 - 40 ft	22 - 25 ft	13 - 16 ft	18 - 21 ft
Method Analyte Group	Compound	CAS #	Units								
RA WG SVOCs EPHs	4-Chloroaniline	106-47-8	ug/l								
RA WG SVOCs EPHs	4-Chlorophenyl-Phenylether	7005-72-3	ug/l								
RA WG SVOCs EPHs	4-Nitroaniline	100-01-6	ug/l								
RA WG SVOCs EPHs	4-Nitrophenol	100-02-7	ug/l								
RA WG SVOCs EPHs	Benzoic acid	65-85-0	ug/l								
RA WG SVOCs EPHs	Benzyl Alcohol	100-51-6	ug/l								
RA WG SVOCs EPHs	Bis-(2-Chloroethoxy)-Methane	111-91-1	ug/l								
RA WG SVOCs EPHs	Bis-(2-Chloroethyl)-Ether	111-44-4	ug/l								
RA WG SVOCs EPHs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	ug/l								
RA WG SVOCs EPHs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	ug/l								
RA WG SVOCs EPHs	Butyl Benzyl Phthalate	85-68-7	ug/l								
RA WG SVOCs EPHs	Carbazole	86-74-8	ug/l								
RA WG SVOCs EPHs	Dibenzofuran	132-64-9	ug/l								
RA WG SVOCs EPHs	Diethyl Phthalate	84-66-2	ug/l								
RA WG SVOCs EPHs	Dimethyl Phthalate	131-11-3	ug/l								
RA WG SVOCs EPHs	Di-n-Butyl Phthalate	84-74-2	ug/l								
RA WG SVOCs EPHs	Di-n-Octyl Phthalate	117-84-0	ug/l								
RA WG SVOCs EPHs	Hexachlorobenzene	118-74-1	ug/l								
RA WG SVOCs EPHs	Hexachloroethane	67-72-1	ug/l								
RA WG SVOCs EPHs	Isophorone	78-59-1	ug/l								
RA WG SVOCs EPHs	Nitrobenzene	98-95-3	ug/l								
RA WG SVOCs EPHs	n-Nitroso-Di-Methylamine	62-75-9	ug/l								
RA WG SVOCs EPHs	n-Nitroso-Di-n-Propylamine	621-64-7	ug/l								
RA WG SVOCs EPHs	n-Nitroso-Di-Phenylamine	86-30-6	ug/l								
RA WG SVOCs EPHs	Pentachlorophenol	87-86-5	ug/l								
RA WG SVOCs EPHs	Phenol	108-95-2	ug/l								
RA WG SVOCs-SIM	1-Methylnaphthalene	90-12-0	ug/l								
RA WG SVOCs-SIM	2-Methylnaphthalene	91-57-6	ug/l								
RA WG SVOCs-SIM	Acenaphthene	83-32-9	ug/l								
RA WG SVOCs-SIM	Acenaphthylene	208-96-8	ug/l								
RA WG SVOCs-SIM	Anthracene	120-12-7	ug/l								
RA WG SVOCs-SIM	Benzo(a)anthracene	56-55-3	ug/l								
RA WG SVOCs-SIM	Benzo(a)Pyrene	50-32-8	ug/l								
RA WG SVOCs-SIM	Benzo(b)fluoranthene	205-99-2	ug/l								
RA WG SVOCs-SIM	Benzo(g,h,i)Perylene	191-24-2	ug/l								
RA WG SVOCs-SIM	Benzo(k)Fluoranthene	207-08-9	ug/l								
RA WG SVOCs-SIM	Chrysene	218-01-9	ug/l								
RA WG SVOCs-SIM	Dibenzo(a,h)Anthracene	53-70-3	ug/l								
RA WG SVOCs-SIM	Fluoranthene	206-44-0	ug/l								
RA WG SVOCs-SIM	Fluorene	86-73-7	ug/l								
RA WG SVOCs-SIM	Indeno(1,2,3-CD)Pyrene	193-39-5	ug/l								
RA WG SVOCs-SIM	Naphthalene	91-20-3	ug/l								
RA WG SVOCs-SIM	Phenanthrene	85-01-8	ug/l								
RA WG SVOCs-SIM	Pyrene	129-00-0	ug/l								
RA WG VOCs VPHs	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	
RA WG VOCs VPHs	1,1,1-Trichloroethane	71-55-6	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	
RA WG VOCs VPHs	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	
RA WG VOCs VPHs	1,1,2-Trichloroethane	79-00-5	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	
RA WG VOCs VPHs	1,1-Dichloroethane	75-34-3	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	
RA WG VOCs VPHs	1,1-Dichloroethene	75-35-4	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	
RA WG VOCs VPHs	1,1-Dichloropropene	563-58-6	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	
RA WG VOCs VPHs	1,2,3-Trichlorobenzene	87-61-6	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	
RA WG VOCs VPHs	1,2,3-Trichloropropane	96-18-4	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	
RA WG VOCs VPHs	1,2,4-Trichlorobenzene	120-82-1	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	TS-UP-1	TS-UP-1	TS-UP-1	TS-UP-1	TS-UP-2	TS-UP-2	TS-UP-2
				Sample Type Code	N	FD	FD	FD	N	N	N
				Sample ID	TS-UP-1-MW6-3940	DUP 02	DUP-02	TS-UP-1-MW6-3940DUP	TS-UP-2-MW3-2225	TS-UP-2-MW1-1316	TS-UP-2-MW2-1821
				Sample Date	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/24/2014	7/24/2014
				Depth Interval	39 - 40 ft	39 - 40 ft	39 - 40 ft	39 - 40 ft	22 - 25 ft	13 - 16 ft	18 - 21 ft
Method Analyte Group	Compound	CAS #	Units								
RA WG VOCs VPHs	1,2,4-Trimethylbenzene	95-63-6	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dibromoethane	106-93-4	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dichlorobenzene	95-50-1	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dichloroethane	107-06-2	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,2-Dichloropropane	78-87-5	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,3,5-Trimethylbenzene	108-67-8	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,3-Dichlorobenzene	541-73-1	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,3-Dichloropropane	142-28-9	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	1,4-Dichlorobenzene	106-46-7	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	2,2-Dichloropropane	594-20-7	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	2-Butanone (MEK)	78-93-3	ug/l	5 U		5 U		5 U	5 U	5 U	5 U
RA WG VOCs VPHs	2-Chlorotoluene	95-49-8	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	2-Hexanone	591-78-6	ug/l	2.5 U		2.5 U		2.5 U	2.5 U	2.5 U	2.5 U
RA WG VOCs VPHs	4-Chlorotoluene	106-43-4	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	4-Isopropyltoluene	99-87-6	ug/l	0.25 U		0.25 U		0.1 J	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	4-Methyl-2-pentanone	108-10-1	ug/l	2.5 U		2.5 U		2.5 U	2.5 U	2.5 U	2.5 U
RA WG VOCs VPHs	Acetone	67-64-1	ug/l	5 U		5 U		5 U	5 U	5 U	5 U
RA WG VOCs VPHs	Benzene	71-43-2	ug/l	0.14 J		0.14 J		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Bromobenzene	108-86-1	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Bromochloromethane	74-97-5	ug/l	0.5 U		0.5 U		0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Bromodichloromethane	75-27-4	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Bromoform	75-25-2	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Bromomethane	74-83-9	ug/l	0.59 U		0.59 U		0.59 U	0.59 U	0.59 U	0.59 U
RA WG VOCs VPHs	Carbon Disulfide	75-15-0	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Carbon Tetrachloride	56-23-5	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Chlorobenzene	108-90-7	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Chloroethane	75-00-3	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Chloroform	67-66-3	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Chloromethane	74-87-3	ug/l	0.47 J		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	cis-1,2-Dichloroethene	156-59-2	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	dibromochloromethane	124-48-1	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Dibromomethane	74-95-3	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Dichlorodifluoromethane	75-71-8	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Diisopropyl Ether	108-20-3	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Ethylbenzene	100-41-4	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Freon 113	76-13-1	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Hexachlorobutadiene	87-68-3	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Hexane	110-54-3	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Isopropylbenzene	98-82-8	ug/l	0.25 U		0.25 U		0.32 J	0.25 U	0.22 J	
RA WG VOCs VPHs	M,P-Xylenes	179601-23-1	ug/l	0.5 U		0.5 U		0.5 U	0.5 U	0.5 U	0.5 U
RA WG VOCs VPHs	Methylene Chloride	75-09-2	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Naphthalene	91-20-3	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.21 J
RA WG VOCs VPHs	n-Butylbenzene	104-51-8	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	n-Propylbenzene	103-65-1	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	O-Xylene	95-47-6	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	sec-Butylbenzene	135-98-8	ug/l	0.84		0.62		3.8	0.25 U	0.25 U	2.5
RA WG VOCs VPHs	Styrene	100-42-5	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	tert-Butylbenzene	98-06-6	ug/l	0.85		0.66		2.2	0.25 U	0.25 U	1.4
RA WG VOCs VPHs	Tetrachloroethene	127-18-4	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U
RA WG VOCs VPHs	Tetrahydrofuran	109-99-9	ug/l	2.5 U		2.5 U		2.5 U	2.5 U	2.5 U	2.5 U
RA WG VOCs VPHs	Toluene	108-88-3	ug/l	0.15 J		0.25 U		0.25 U	0.25 U	0.25 U	0.25 U

ATTACHMENT A, TABLE A-3B
GROUNDWATER ANALYTICAL DATA
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	TS-UP-1	TS-UP-1	TS-UP-1	TS-UP-1	TS-UP-2	TS-UP-2	TS-UP-2
				Sample Type Code	N	FD	FD	FD	N	N	N
				Sample ID	TS-UP-1-MW6-3940	DUP 02	DUP-02	TS-UP-1-MW6-3940DUP	TS-UP-2-MW3-2225	TS-UP-2-MW1-1316	TS-UP-2-MW2-1821
				Sample Date	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/23/2014	7/24/2014	7/24/2014
				Depth Interval	39 - 40 ft	39 - 40 ft	39 - 40 ft	39 - 40 ft	22 - 25 ft	13 - 16 ft	18 - 21 ft
Method Analyte Group	Compound	CAS #	Units								
RA_WG_VOCs_VPHs	Xylenes, total (a)	1330-20-7	ug/l								
RA_WG_VOCs_VPHs	Total Xylenes (b)	Tot-Xylenes	ug/l	0.75 U		0.75 U		0.75 U	0.75 U	0.75 U	
RA_WG_VOCs_VPHs	trans-1,2-Dichloroethene	156-60-5	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	Trichloroethylene	79-01-6	ug/l	0.91		1.2		0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	Trichlorofluoromethane	75-69-4	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	
RA_WG_VOCs_VPHs	Vinyl Chloride	75-01-4	ug/l	0.25 U		0.25 U		0.25 U	0.25 U	0.25 U	

Notes:
CAS = Chemical Abstracts Service.
EPH = Extractable Petroleum Hydrocarbons.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SIM = Selected ion monitoring.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
VPH = Volatile Petroleum Hydrocarbons.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-4A
POREWATER SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-1	10/29/2008	PW-1-102908	N		0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-101	11/28/2011	PW-101A 1 - 11-28-2011	N		0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-101	11/28/2011	PW-101A 1 F - 11-28-2011	N		0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-102	11/28/2011	PW-102A 1 -11-28-2011	N		0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-102	11/28/2011	PW-102A 1 F - 11-28-2011	N		0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-102	11/28/2011	PW-102A-D 1 - 11-28-2011	FD	PW-102A 1 -11-28-2011	0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-103	11/28/2011	PW-103A 1 - 11-28-2011	N		0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-103	11/28/2011	PW-103A 1 F - 11-28-2011	N		0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-104	11/28/2011	PW-104A 1 - 11-28-2011	N		0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-104	11/28/2011	PW-104A 1 F - 11-28-2011	N		0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-104	11/28/2011	PW-104A 1DUP - 11-28-2011	FD	PW-104A 1 - 11-28-2011	0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-105	11/28/2011	PW-105A 1 - 11-28-2011	N		0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-105	11/28/2011	PW-105A 1 F - 11-28-2011	N		0.75 - 1 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-1-2014	7/30/2014	PW-1-A	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-1-2014	7/30/2014	PW-1-A-F	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-1-2014	7/30/2014	PW-1-AM	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-1-2014	7/30/2014	PW-199-A	FD	PW-1-A	2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-1-2014	7/30/2014	PW-199-A-F	FD	PW-1-A-F	2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-1-2014	7/30/2014	PW-1-ADUP	FD	PW-1-A	2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-1-2014	7/30/2014	PW-1-A-FDUP	FD	PW-1-A-F	2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-2-2014	7/30/2014	PW-2-A	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-2-2014	7/30/2014	PW-2-A-F	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-2-2014	7/30/2014	PW-2-AM	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-3-2014	7/30/2014	PW-3-A	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-3-2014	7/30/2014	PW-3-A-F	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-3-2014	7/30/2014	PW-3-AM	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-4-2014	7/29/2014	PW-4-A	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-4-2014	7/29/2014	PW-4-A-F	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-4-2014	7/29/2014	PW-4-AM	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-5-2014	7/29/2014	PW-5-A	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-5-2014	7/29/2014	PW-5-A-F	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-5-2014	7/29/2014	PW-5-AM	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-C	8/4/2014	PW-C-AM	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-E	8/4/2014	PW-E-AM	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-F	8/4/2014	PW-F-AM	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-F	8/4/2014	PW-F-AM-DUP	FD	PW-F-AM	2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-H	8/1/2014	PW-H-AM	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-I	8/1/2014	PW-I-AM	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-TS1A	8/4/2014	PW-TS1A-AM	N		2.7 - 3 ft
PW	Off-Project Red Maple Swamp /Tidal Marsh	PW-TS1C	8/4/2014	PW-TS1C-AM	N		2.7 - 3 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-2	10/29/2008	PW-2-102908	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-3	10/29/2008	PW-3-102908	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-4	10/29/2008	PW-4-102908	N		2.7 - 3 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-5	10/29/2008	PW-5-102908	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-10-090115	9/1/2015	PW-OFF-10-090115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-10-090115	9/1/2015	PW-OFF-10F-090115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-10-090115	9/1/2015	PW-OFF-10X-090115	FD	PW-OFF-10-090115	0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-10-090115	9/1/2015	PW-OFF-10XF-090115	FD	PW-OFF-10F-090115	0.75 - 1 ft

ATTACHMENT A, TABLE A-4A
POREWATER SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-1-083115	8/31/2015	PW-OFF-1-083115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-1-083115	8/31/2015	PW-OFF-1F-083115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-2-083115	8/31/2015	PW-OFF-2-083115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-2-083115	8/31/2015	PW-OFF-2F-083115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-3-083115	8/31/2015	PW-OFF-3-083115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-3-083115	8/31/2015	PW-OFF-3F-083115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-4-083115	8/31/2015	PW-OFF-4-083115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-4-083115	8/31/2015	PW-OFF-4F-083115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-5-083115	8/31/2015	PW-OFF-5-083115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-5-083115	8/31/2015	PW-OFF-5F-083115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-6-083115	8/31/2015	PW-OFF-6-083115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-6-083115	8/31/2015	PW-OFF-6F-083115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-7-090115	9/1/2015	PW-OFF-7-090115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-7-090115	9/1/2015	PW-OFF-7F-090115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-8-090115	9/1/2015	PW-OFF-8-090115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-8-090115	9/1/2015	PW-OFF-8F-090115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-9-090115	9/1/2015	PW-OFF-9-090115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-OFF-9-090115	9/1/2015	PW-OFF-9F-090115	N		0.75 - 1 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-10-082515	8/25/2015	PW-ON-10-082515	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-10-082515	8/25/2015	PW-ON-10F-082515	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-1-082615	8/26/2015	PW-ON-1-082615	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-1-082615	8/26/2015	PW-ON-1F-082615	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-2-082615	8/26/2015	PW-ON-2-082615	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-2-082615	8/26/2015	PW-ON-2F-082615	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-3-082615	8/26/2015	PW-ON-3-082615	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-3-082615	8/26/2015	PW-ON-3F-082615	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-4-082715	8/27/2015	PW-ON-4-082715	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-4-082715	8/27/2015	PW-ON-4F-082715	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-5-082715	8/27/2015	PW-ON-5-082715	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-5-082715	8/27/2015	PW-ON-5F-082715	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-5-082715	8/27/2015	PW-ON-59X-082715	FD	PW-ON-5-082715	1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-5-082715	8/27/2015	PW-ON-59XF-082715	FD	PW-ON-5F-082715	1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-6-082715	8/27/2015	PW-ON-6-082715	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-6-082715	8/27/2015	PW-ON-6F-082715	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-7-082715	8/27/2015	PW-ON-7-082715	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-7-082715	8/27/2015	PW-ON-7F-082715	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-8-082715	8/27/2015	PW-ON-8-082715	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-8-082715	8/27/2015	PW-ON-8F-082715	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-9-082515	8/25/2015	PW-ON-9-082515	N		1 - 1.25 ft
PW	Off-Project Narragansett Bay and Beachfront	PW-ON-9-082515	8/25/2015	PW-ON-9F-082515	N		1 - 1.25 ft

Notes:
FD - Field duplicate.
ft - Feet.
N - Normal sample.
PW - Porewater.

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location Group												
Location ID					PW-2	PW-3	PW-4	PW-5	PW-OFF-10-090115	PW-OFF-10-090115	PW-OFF-10-090115	PW-OFF-10-090115
Sample Type Code					N	N	N	N	N	N	FD	FD
Sample ID					PW-2-102908	PW-3-102908	PW-4-102908	PW-5-102908	PW-OFF-10-090115	PW-OFF-10F-090115	PW-OFF-10X-090115	PW-OFF-10XF-090115
Sample Date					10/29/2008	10/29/2008	10/29/2008	10/29/2008	9/1/2015	9/1/2015	9/1/2015	9/1/2015
Depth Interval					0.75 - 1 ft	0.75 - 1 ft	2.7 - 3 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA_PW_Metals	D	Arsenic	7440-38-2	ug/l						4 J		
RA_PW_Metals	D	Barium	7440-39-3	ug/l						25 U		
RA_PW_Metals	D	Cadmium	7440-43-9	ug/l						4 U		
RA_PW_Metals	D	Chromium	7440-47-3	ug/l						25 U		
RA_PW_Metals	D	HEXAVALENT CHROMIUM	18540-29-9	ug/l						2.1 U		2.1 U
RA_PW_Metals	D	Lead	7439-92-1	ug/l						13 U		
RA_PW_Metals	D	Mercury	7439-97-6	ug/l						0.15 U		
RA_PW_Metals	D	Selenium	7782-49-2	ug/l						10 U		
RA_PW_Metals	D	Silver	7440-22-4	ug/l						13 U		
RA_PW_Metals	T	Arsenic	7440-38-2	ug/l					4 U			
RA_PW_Metals	T	Barium	7440-39-3	ug/l					25 U			
RA_PW_Metals	T	Cadmium	7440-43-9	ug/l					4 U			
RA_PW_Metals	T	Chromium	7440-47-3	ug/l					25 U			
RA_PW_Metals	T	HEXAVALENT CHROMIUM	18540-29-9	ug/l					2.1 U		2.1 U	
RA_PW_Metals	T	Lead	7439-92-1	ug/l					13 U			
RA_PW_Metals	T	Mercury	7439-97-6	ug/l					0.15 U			
RA_PW_Metals	T	Selenium	7782-49-2	ug/l					10 U			
RA_PW_Metals	T	Silver	7440-22-4	ug/l					13 U			
RA_PW_VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U				
RA_PW_VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,1-Dichloroethane	75-34-3	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,1-Dichloroethene	75-35-4	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,1-Dichloropropene	563-58-6	ug/l	2 U	2 U	2 U	2 U				
RA_PW_VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	5 U	5 U	5 U	5 U				
RA_PW_VOCs	N	1,2-Dibromoethane	106-93-4	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,2-Dichloroethane	107-06-2	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,2-Dichloropropane	78-87-5	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,3-Dichloropropane	142-28-9	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	1-Chlorohexane	544-10-5	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	2,2-Dichloropropane	594-20-7	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	2-Butanone (MEK)	78-93-3	ug/l	25 U	25 U	25 U	25 U				
RA_PW_VOCs	N	2-Chlorotoluene	95-49-8	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	2-Hexanone	591-78-6	ug/l	10 U	10 U	10 U	10 U				
RA_PW_VOCs	N	4-Chlorotoluene	106-43-4	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	4-Isopropyltoluene	99-87-6	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l	25 U	25 U	25 U	25 U				
RA_PW_VOCs	N	Acetone	67-64-1	ug/l	25 U	25 U	25 U	25 U				
RA_PW_VOCs	N	Benzene	71-43-2	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Bromobenzene	108-86-1	ug/l	2 U	2 U	2 U	2 U				
RA_PW_VOCs	N	Bromochloromethane	74-97-5	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Bromodichloromethane	75-27-4	ug/l	0.6 U	0.6 U	0.6 U	0.6 U				

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location Group												
Location ID					PW-2	PW-3	PW-4	PW-5	PW-OFF-10-090115	PW-OFF-10-090115	PW-OFF-10-090115	PW-OFF-10-090115
Sample Type Code					N	N	N	N	N	N	FD	FD
Sample ID					PW-2-102908	PW-3-102908	PW-4-102908	PW-5-102908	PW-OFF-10-090115	PW-OFF-10F-090115	PW-OFF-10X-090115	PW-OFF-10XF-090115
Sample Date					10/29/2008	10/29/2008	10/29/2008	10/29/2008	9/1/2015	9/1/2015	9/1/2015	9/1/2015
Depth Interval					0.75 - 1 ft	0.75 - 1 ft	2.7 - 3 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA_PW_VOCs	N	Bromoform	75-25-2	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Bromomethane	74-83-9	ug/l	2 U	2 U	2 U	2 U				
RA_PW_VOCs	N	Carbon Disulfide	75-15-0	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Carbon Tetrachloride	56-23-5	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Chlorobenzene	108-90-7	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Chloroethane	75-00-3	ug/l	2 U	2 U	2 U	2 U				
RA_PW_VOCs	N	Chloroform	67-66-3	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Chloromethane	74-87-3	ug/l	2 U	2 U	2 U	2 U				
RA_PW_VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.4 U	0.4 U	0.4 U	0.4 U				
RA_PW_VOCs	N	Cyclohexane	110-82-7	ug/l	5 U	5 U	5 U	5 U				
RA_PW_VOCs	N	dibromochloromethane	124-48-1	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Dibromomethane	74-95-3	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l	2 U	2 U	2 U	2 U				
RA_PW_VOCs	N	Ethylbenzene	100-41-4	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Freon 113	76-13-1	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Hexachlorobutadiene	87-68-3	ug/l	0.6 U	0.6 U	0.6 U	0.6 U				
RA_PW_VOCs	N	Isopropylbenzene	98-82-8	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	M,P-Xylenes	179601-23-1	ug/l	2 U	2 U	2 U	2 U				
RA_PW_VOCs	N	Methyl Acetate	79-20-9	ug/l	5 U	5 U	5 U	5 U				
RA_PW_VOCs	N	Methylcyclohexane	108-87-2	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Methylene Chloride	75-09-2	ug/l	4 U	4 U	4 U	4 U				
RA_PW_VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Naphthalene	91-20-3	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	n-Butylbenzene	104-51-8	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	n-Propylbenzene	103-65-1	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	O-Xylene	95-47-6	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	sec-Butylbenzene	135-98-8	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Styrene	100-42-5	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	tert-Butylbenzene	98-06-6	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Tetrachloroethene	127-18-4	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Tetrahydrofuran	109-99-9	ug/l	5 U	5 U	5 U	5 U				
RA_PW_VOCs	N	Toluene	108-88-3	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l	3.0 U	3.0 U	3.0 U	3.0 U				
RA_PW_VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.5 U	0.5 U	0.5 U	0.5 U				
RA_PW_VOCs	N	Trichloroethylene	79-01-6	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Trichlorofluoromethane	75-69-4	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	N	Vinyl Acetate	108-05-4	ug/l	5 U	5 U	5 U	5 U				
RA_PW_VOCs	N	Vinyl Chloride	75-01-4	ug/l	1 U	1 U	1 U	1 U				
RA_PW_VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l					5 U			
RA_PW_VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l					5 U			
RA_PW_VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l					5 U			
RA_PW_VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l					5 U			
RA_PW_VOCs	T	1,1-Dichloroethane	75-34-3	ug/l					5 U			
RA_PW_VOCs	T	1,1-Dichloroethene	75-35-4	ug/l					5 U			
RA_PW_VOCs	T	1,1-Dichloropropene	563-58-6	ug/l					5 U			
RA_PW_VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l					20 U			
RA_PW_VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l					10 U			
RA_PW_VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l					10 U			
RA_PW_VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l					5 U			

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location Group												
Location ID					PW-2	PW-3	PW-4	PW-5	PW-OFF-10-090115	PW-OFF-10-090115	PW-OFF-10-090115	PW-OFF-10-090115
Sample Type Code					N	N	N	N	N	N	FD	FD
Sample ID					PW-2-102908	PW-3-102908	PW-4-102908	PW-5-102908	PW-OFF-10-090115	PW-OFF-10F-090115	PW-OFF-10X-090115	PW-OFF-10XF-090115
Sample Date					10/29/2008	10/29/2008	10/29/2008	10/29/2008	9/1/2015	9/1/2015	9/1/2015	9/1/2015
Depth Interval					0.75 - 1 ft	0.75 - 1 ft	2.7 - 3 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA_PW_VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l					10 U			
RA_PW_VOCs	T	1,2-Dibromoethane	106-93-4	ug/l					10 U			
RA_PW_VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l					5 U			
RA_PW_VOCs	T	1,2-Dichloroethane	107-06-2	ug/l					5 U			
RA_PW_VOCs	T	1,2-Dichloropropane	78-87-5	ug/l					5 U			
RA_PW_VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l					5 U			
RA_PW_VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l					5 U			
RA_PW_VOCs	T	1,3-Dichloropropane	142-28-9	ug/l					10 U			
RA_PW_VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l					5 U			
RA_PW_VOCs	T	2,2-Dichloropropane	594-20-7	ug/l					20 U			
RA_PW_VOCs	T	2-Butanone (MEK)	78-93-3	ug/l					50 U			
RA_PW_VOCs	T	2-Chlorotoluene	95-49-8	ug/l					10 U			
RA_PW_VOCs	T	2-Hexanone	591-78-6	ug/l					50 U			
RA_PW_VOCs	T	4-Chlorotoluene	106-43-4	ug/l					10 U			
RA_PW_VOCs	T	4-Isopropyltoluene	99-87-6	ug/l					10 U			
RA_PW_VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l					20 U			
RA_PW_VOCs	T	Acetone	67-64-1	ug/l					50 U			
RA_PW_VOCs	T	Benzene	71-43-2	ug/l					5 U			
RA_PW_VOCs	T	Bromobenzene	108-86-1	ug/l					10 U			
RA_PW_VOCs	T	Bromochloromethane	74-97-5	ug/l					5 U			
RA_PW_VOCs	T	Bromodichloromethane	75-27-4	ug/l					5 U			
RA_PW_VOCs	T	Bromoform	75-25-2	ug/l					5 U			
RA_PW_VOCs	T	Bromomethane	74-83-9	ug/l					10 U			
RA_PW_VOCs	T	Carbon Disulfide	75-15-0	ug/l					5 U			
RA_PW_VOCs	T	Carbon Tetrachloride	56-23-5	ug/l					5 U			
RA_PW_VOCs	T	Chlorobenzene	108-90-7	ug/l					5 U			
RA_PW_VOCs	T	Chloroethane	75-00-3	ug/l					5 U			
RA_PW_VOCs	T	Chloroform	67-66-3	ug/l					5 U			
RA_PW_VOCs	T	Chloromethane	74-87-3	ug/l					10 U			
RA_PW_VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l					5 U			
RA_PW_VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l					5 U			
RA_PW_VOCs	T	dibromochloromethane	124-48-1	ug/l					5 U			
RA_PW_VOCs	T	Dibromomethane	74-95-3	ug/l					10 U			
RA_PW_VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l					10 U			
RA_PW_VOCs	T	Ethylbenzene	100-41-4	ug/l					5 U			
RA_PW_VOCs	T	Hexachlorobutadiene	87-68-3	ug/l					10 U			
RA_PW_VOCs	T	Isopropylbenzene	98-82-8	ug/l					10 U			
RA_PW_VOCs	T	M,P-Xylenes	179601-23-1	ug/l					10 U			
RA_PW_VOCs	T	Methylene Chloride	75-09-2	ug/l					10 U			
RA_PW_VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l					5 U			
RA_PW_VOCs	T	Naphthalene	91-20-3	ug/l					20 U			
RA_PW_VOCs	T	n-Butylbenzene	104-51-8	ug/l					10 U			
RA_PW_VOCs	T	n-Propylbenzene	103-65-1	ug/l					10 U			
RA_PW_VOCs	T	O-Xylene	95-47-6	ug/l					5 U			
RA_PW_VOCs	T	sec-Butylbenzene	135-98-8	ug/l					10 U			
RA_PW_VOCs	T	Styrene	100-42-5	ug/l					5 U			
RA_PW_VOCs	T	tert-Butylbenzene	98-06-6	ug/l					10 U			
RA_PW_VOCs	T	Tetrachloroethene	127-18-4	ug/l					5 U			
RA_PW_VOCs	T	Toluene	108-88-3	ug/l					5 U			
RA_PW_VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l					15 U			
RA_PW_VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l					5 U			

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
				Location ID	PW-2	PW-3	PW-4	PW-5	PW-OFF-10-090115	PW-OFF-10-090115	PW-OFF-10-090115	PW-OFF-10-090115
				Sample Type Code	N	N	N	N	N	N	FD	FD
				Sample ID	PW-2-102908	PW-3-102908	PW-4-102908	PW-5-102908	PW-OFF-10-090115	PW-OFF-10F-090115	PW-OFF-10X-090115	PW-OFF-10XF-090115
				Sample Date	10/29/2008	10/29/2008	10/29/2008	10/29/2008	9/1/2015	9/1/2015	9/1/2015	9/1/2015
				Depth Interval	0.75 - 1 ft	0.75 - 1 ft	2.7 - 3 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA_PW_VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l					5 U			
RA_PW_VOCs	T	Trichloroethylene	79-01-6	ug/l					5 U			
RA_PW_VOCs	T	Trichlorofluoromethane	75-69-4	ug/l					10 U			
RA_PW_VOCs	T	Vinyl Chloride	75-01-4	ug/l					5 U			

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-OFF-1-083115	PW-OFF-1-083115	PW-OFF-2-083115	PW-OFF-2-083115	PW-OFF-3-083115	PW-OFF-3-083115	PW-OFF-4-083115	PW-OFF-4-083115
					Sample Type Code	N	N	N	N	N	N	N	N
					Sample ID	PW-OFF-1-083115	PW-OFF-1F-083115	PW-OFF-2-083115	PW-OFF-2F-083115	PW-OFF-3-083115	PW-OFF-3F-083115	PW-OFF-4-083115	PW-OFF-4F-083115
					Sample Date	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015
					Depth Interval	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA PW Metals	D	Arsenic	7440-38-2	ug/l		4 U		4 U		10 U		10 U
RA PW Metals	D	Barium	7440-39-3	ug/l		25 U		25 U		25 U		25 U
RA PW Metals	D	Cadmium	7440-43-9	ug/l		4 U		4 U		10 U		10 U
RA PW Metals	D	Chromium	7440-47-3	ug/l		25 U		25 U		25 U		25 U
RA PW Metals	D	HEXAVALENT CHROMIUM	18540-29-9	ug/l								
RA PW Metals	D	Lead	7439-92-1	ug/l		13 U		13 U		13 U		13 U
RA PW Metals	D	Mercury	7439-97-6	ug/l		0.15 U		0.15 U		0.15 U		0.15 U
RA PW Metals	D	Selenium	7782-49-2	ug/l		10 U		10 U		25 U		25 U
RA PW Metals	D	Silver	7440-22-4	ug/l		13 U		13 U		13 U		13 U
RA PW Metals	T	Arsenic	7440-38-2	ug/l	4 U		4 U		4.6 J		4 U	
RA PW Metals	T	Barium	7440-39-3	ug/l	25 U		25 U		25 U		33.9 J	
RA PW Metals	T	Cadmium	7440-43-9	ug/l	4 U		4 U		4 U		4 U	
RA PW Metals	T	Chromium	7440-47-3	ug/l	10 U		25 U		25 U		14.4 J	
RA PW Metals	T	HEXAVALENT CHROMIUM	18540-29-9	ug/l								
RA PW Metals	T	Lead	7439-92-1	ug/l	13 U		13 U		13 U		13 U	
RA PW Metals	T	Mercury	7439-97-6	ug/l	0.15 U		0.15 U		0.15 U		0.15 U	
RA PW Metals	T	Selenium	7782-49-2	ug/l	10 U		10 U		10 U		10 U	
RA PW Metals	T	Silver	7440-22-4	ug/l	13 U		13 U		13 U		5 U	
RA PW VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l								
RA PW VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l								
RA PW VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l								
RA PW VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l								
RA PW VOCs	N	1,1-Dichloroethane	75-34-3	ug/l								
RA PW VOCs	N	1,1-Dichloroethene	75-35-4	ug/l								
RA PW VOCs	N	1,1-Dichloropropene	563-58-6	ug/l								
RA PW VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l								
RA PW VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l								
RA PW VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l								
RA PW VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l								
RA PW VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l								
RA PW VOCs	N	1,2-Dibromoethane	106-93-4	ug/l								
RA PW VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l								
RA PW VOCs	N	1,2-Dichloroethane	107-06-2	ug/l								
RA PW VOCs	N	1,2-Dichloropropane	78-87-5	ug/l								
RA PW VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l								
RA PW VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l								
RA PW VOCs	N	1,3-Dichloropropane	142-28-9	ug/l								
RA PW VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l								
RA PW VOCs	N	1-Chlorohexane	544-10-5	ug/l								
RA PW VOCs	N	2,2-Dichloropropane	594-20-7	ug/l								
RA PW VOCs	N	2-Butanone (MEK)	78-93-3	ug/l								
RA PW VOCs	N	2-Chlorotoluene	95-49-8	ug/l								
RA PW VOCs	N	2-Hexanone	591-78-6	ug/l								
RA PW VOCs	N	4-Chlorotoluene	106-43-4	ug/l								
RA PW VOCs	N	4-Isopropyltoluene	99-87-6	ug/l								
RA PW VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l								
RA PW VOCs	N	Acetone	67-64-1	ug/l								
RA PW VOCs	N	Benzene	71-43-2	ug/l								
RA PW VOCs	N	Bromobenzene	108-86-1	ug/l								
RA PW VOCs	N	Bromochloromethane	74-97-5	ug/l								
RA PW VOCs	N	Bromodichloromethane	75-27-4	ug/l								

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-OFF-1-083115	PW-OFF-1-083115	PW-OFF-2-083115	PW-OFF-2-083115	PW-OFF-3-083115	PW-OFF-3-083115	PW-OFF-4-083115	PW-OFF-4-083115
					Sample Type Code	N	N	N	N	N	N	N	N
					Sample ID	PW-OFF-1-083115	PW-OFF-1F-083115	PW-OFF-2-083115	PW-OFF-2F-083115	PW-OFF-3-083115	PW-OFF-3F-083115	PW-OFF-4-083115	PW-OFF-4F-083115
					Sample Date	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015
					Depth Interval	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA PW VOCs	N	Bromoform	75-25-2	ug/l									
RA PW VOCs	N	Bromomethane	74-83-9	ug/l									
RA PW VOCs	N	Carbon Disulfide	75-15-0	ug/l									
RA PW VOCs	N	Carbon Tetrachloride	56-23-5	ug/l									
RA PW VOCs	N	Chlorobenzene	108-90-7	ug/l									
RA PW VOCs	N	Chloroethane	75-00-3	ug/l									
RA PW VOCs	N	Chloroform	67-66-3	ug/l									
RA PW VOCs	N	Chloromethane	74-87-3	ug/l									
RA PW VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l									
RA PW VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l									
RA PW VOCs	N	Cyclohexane	110-82-7	ug/l									
RA PW VOCs	N	dibromochloromethane	124-48-1	ug/l									
RA PW VOCs	N	Dibromomethane	74-95-3	ug/l									
RA PW VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l									
RA PW VOCs	N	Ethylbenzene	100-41-4	ug/l									
RA PW VOCs	N	Freon 113	76-13-1	ug/l									
RA PW VOCs	N	Hexachlorobutadiene	87-68-3	ug/l									
RA PW VOCs	N	Isopropylbenzene	98-82-8	ug/l									
RA PW VOCs	N	M,P-Xylenes	179601-23-1	ug/l									
RA PW VOCs	N	Methyl Acetate	79-20-9	ug/l									
RA PW VOCs	N	Methylcyclohexane	108-87-2	ug/l									
RA PW VOCs	N	Methylene Chloride	75-09-2	ug/l									
RA PW VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l									
RA PW VOCs	N	Naphthalene	91-20-3	ug/l									
RA PW VOCs	N	n-Butylbenzene	104-51-8	ug/l									
RA PW VOCs	N	n-Propylbenzene	103-65-1	ug/l									
RA PW VOCs	N	O-Xylene	95-47-6	ug/l									
RA PW VOCs	N	sec-Butylbenzene	135-98-8	ug/l									
RA PW VOCs	N	Styrene	100-42-5	ug/l									
RA PW VOCs	N	tert-Butylbenzene	98-06-6	ug/l									
RA PW VOCs	N	Tetrachloroethene	127-18-4	ug/l									
RA PW VOCs	N	Tetrahydrofuran	109-99-9	ug/l									
RA PW VOCs	N	Toluene	108-88-3	ug/l									
RA PW VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l									
RA PW VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l									
RA PW VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l									
RA PW VOCs	N	Trichloroethylene	79-01-6	ug/l									
RA PW VOCs	N	Trichlorofluoromethane	75-69-4	ug/l									
RA PW VOCs	N	Vinyl Acetate	108-05-4	ug/l									
RA PW VOCs	N	Vinyl Chloride	75-01-4	ug/l									
RA PW VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1-Dichloroethane	75-34-3	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1-Dichloroethene	75-35-4	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1-Dichloropropene	563-58-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l	20 U		20 U		20 U		20 U		
RA PW VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l	5 U		5 U		5 U		5 U		

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-OFF-1-083115	PW-OFF-1-083115	PW-OFF-2-083115	PW-OFF-2-083115	PW-OFF-3-083115	PW-OFF-3-083115	PW-OFF-4-083115	PW-OFF-4-083115
					Sample Type Code	N	N	N	N	N	N	N	N
					Sample ID	PW-OFF-1-083115	PW-OFF-1F-083115	PW-OFF-2-083115	PW-OFF-2F-083115	PW-OFF-3-083115	PW-OFF-3F-083115	PW-OFF-4-083115	PW-OFF-4F-083115
					Sample Date	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015
					Depth Interval	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA PW VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	1,2-Dibromoethane	106-93-4	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	1,2-Dichloroethane	107-06-2	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	1,2-Dichloropropane	78-87-5	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	1,3-Dichloropropane	142-28-9	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	2,2-Dichloropropane	594-20-7	ug/l	20 U		20 U		20 U			20 U	
RA PW VOCs	T	2-Butanone (MEK)	78-93-3	ug/l	50 U		50 U		50 U			50 U	
RA PW VOCs	T	2-Chlorotoluene	95-49-8	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	2-Hexanone	591-78-6	ug/l	50 U		50 U		50 U			50 U	
RA PW VOCs	T	4-Chlorotoluene	106-43-4	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	4-Isopropyltoluene	99-87-6	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l	20 U		20 U		20 U			20 U	
RA PW VOCs	T	Acetone	67-64-1	ug/l	50 U		50 U		50 U			50 U	
RA PW VOCs	T	Benzene	71-43-2	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Bromobenzene	108-86-1	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	Bromochloromethane	74-97-5	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Bromodichloromethane	75-27-4	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Bromoform	75-25-2	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Bromomethane	74-83-9	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	Carbon Disulfide	75-15-0	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Carbon Tetrachloride	56-23-5	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Chlorobenzene	108-90-7	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Chloroethane	75-00-3	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Chloroform	67-66-3	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Chloromethane	74-87-3	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	dibromochloromethane	124-48-1	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Dibromomethane	74-95-3	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	Ethylbenzene	100-41-4	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Hexachlorobutadiene	87-68-3	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	Isopropylbenzene	98-82-8	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	M,P-Xylenes	179601-23-1	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	Methylene Chloride	75-09-2	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Naphthalene	91-20-3	ug/l	20 U		20 U		20 U			20 U	
RA PW VOCs	T	n-Butylbenzene	104-51-8	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	n-Propylbenzene	103-65-1	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	O-Xylene	95-47-6	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	sec-Butylbenzene	135-98-8	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	Styrene	100-42-5	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	tert-Butylbenzene	98-06-6	ug/l	10 U		10 U		10 U			10 U	
RA PW VOCs	T	Tetrachloroethene	127-18-4	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Toluene	108-88-3	ug/l	5 U		5 U		5 U			5 U	
RA PW VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l	15 U		15 U		15 U			15 U	
RA PW VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l	5 U		5 U		5 U			5 U	

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location Group					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location ID					PW-OFF-1-083115	PW-OFF-1-083115	PW-OFF-2-083115	PW-OFF-2-083115	PW-OFF-3-083115	PW-OFF-3-083115	PW-OFF-4-083115	PW-OFF-4-083115
Sample Type Code					N	N	N	N	N	N	N	N
Sample ID					PW-OFF-1-083115	PW-OFF-1F-083115	PW-OFF-2-083115	PW-OFF-2F-083115	PW-OFF-3-083115	PW-OFF-3F-083115	PW-OFF-4-083115	PW-OFF-4F-083115
Sample Date					8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015
Depth Interval					0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA_PW_VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Trichloroethylene	79-01-6	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Trichlorofluoromethane	75-69-4	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	Vinyl Chloride	75-01-4	ug/l	5 U		5 U		5 U		5 U	

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-OFF-5-083115	PW-OFF-5-083115	PW-OFF-6-083115	PW-OFF-6-083115	PW-OFF-7-090115	PW-OFF-7-090115	PW-OFF-8-090115	PW-OFF-8-090115
					Sample Type Code	N	N	N	N	N	N	N	N
					Sample ID	PW-OFF-5-083115	PW-OFF-5F-083115	PW-OFF-6-083115	PW-OFF-6F-083115	PW-OFF-7-090115	PW-OFF-7F-090115	PW-OFF-8-090115	PW-OFF-8F-090115
					Sample Date	8/31/2015	8/31/2015	8/31/2015	8/31/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015
					Depth Interval	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA PW Metals	D	Arsenic	7440-38-2	ug/l		4 U		4 U		10 U		4 U	
RA PW Metals	D	Barium	7440-39-3	ug/l		25 U		25 U		29.1 J		25 U	
RA PW Metals	D	Cadmium	7440-43-9	ug/l		4 U		4 U		10 U		4 U	
RA PW Metals	D	Chromium	7440-47-3	ug/l		25 U		25 U		25 U		25 U	
RA PW Metals	D	HEXAVALENT CHROMIUM	18540-29-9	ug/l								2.1 U	
RA PW Metals	D	Lead	7439-92-1	ug/l		13 U		13 U		13 U		13 U	
RA PW Metals	D	Mercury	7439-97-6	ug/l		0.15 U		0.15 U		0.15 U		0.15 U	
RA PW Metals	D	Selenium	7782-49-2	ug/l		10 U		10 U		25 U		10 U	
RA PW Metals	D	Silver	7440-22-4	ug/l		13 U		13 U		13 U		13 U	
RA PW Metals	T	Arsenic	7440-38-2	ug/l	4 U		10 U		10 U		4 U		
RA PW Metals	T	Barium	7440-39-3	ug/l	25 U		25 U		32.9 J		25 U		
RA PW Metals	T	Cadmium	7440-43-9	ug/l	4 U		10 U		10 U		4 U		
RA PW Metals	T	Chromium	7440-47-3	ug/l	25 U		25 U		25 U		25 U		
RA PW Metals	T	HEXAVALENT CHROMIUM	18540-29-9	ug/l							2.1 U		
RA PW Metals	T	Lead	7439-92-1	ug/l	13 U		13 U		17.8 J		13 U		
RA PW Metals	T	Mercury	7439-97-6	ug/l	0.15 U		0.15 U		0.15 U		0.15 U		
RA PW Metals	T	Selenium	7782-49-2	ug/l	10 U		25 U		25 U		10 U		
RA PW Metals	T	Silver	7440-22-4	ug/l	13 U		13 U		13 U		13 U		
RA PW VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l									
RA PW VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l									
RA PW VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l									
RA PW VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l									
RA PW VOCs	N	1,1-Dichloroethane	75-34-3	ug/l									
RA PW VOCs	N	1,1-Dichloroethene	75-35-4	ug/l									
RA PW VOCs	N	1,1-Dichloropropene	563-58-6	ug/l									
RA PW VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l									
RA PW VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l									
RA PW VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l									
RA PW VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l									
RA PW VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l									
RA PW VOCs	N	1,2-Dibromoethane	106-93-4	ug/l									
RA PW VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l									
RA PW VOCs	N	1,2-Dichloroethane	107-06-2	ug/l									
RA PW VOCs	N	1,2-Dichloropropane	78-87-5	ug/l									
RA PW VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l									
RA PW VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l									
RA PW VOCs	N	1,3-Dichloropropane	142-28-9	ug/l									
RA PW VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l									
RA PW VOCs	N	1-Chlorohexane	544-10-5	ug/l									
RA PW VOCs	N	2,2-Dichloropropane	594-20-7	ug/l									
RA PW VOCs	N	2-Butanone (MEK)	78-93-3	ug/l									
RA PW VOCs	N	2-Chlorotoluene	95-49-8	ug/l									
RA PW VOCs	N	2-Hexanone	591-78-6	ug/l									
RA PW VOCs	N	4-Chlorotoluene	106-43-4	ug/l									
RA PW VOCs	N	4-Isopropyltoluene	99-87-6	ug/l									
RA PW VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l									
RA PW VOCs	N	Acetone	67-64-1	ug/l									
RA PW VOCs	N	Benzene	71-43-2	ug/l									
RA PW VOCs	N	Bromobenzene	108-86-1	ug/l									
RA PW VOCs	N	Bromochloromethane	74-97-5	ug/l									
RA PW VOCs	N	Bromodichloromethane	75-27-4	ug/l									

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-OFF-5-083115	PW-OFF-5-083115	PW-OFF-6-083115	PW-OFF-6-083115	PW-OFF-7-090115	PW-OFF-7-090115	PW-OFF-8-090115	PW-OFF-8-090115
					Sample Type Code	N	N	N	N	N	N	N	N
					Sample ID	PW-OFF-5-083115	PW-OFF-5F-083115	PW-OFF-6-083115	PW-OFF-6F-083115	PW-OFF-7-090115	PW-OFF-7F-090115	PW-OFF-8-090115	PW-OFF-8F-090115
					Sample Date	8/31/2015	8/31/2015	8/31/2015	8/31/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015
					Depth Interval	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA_PW_VOCs	N	Bromoform	75-25-2	ug/l									
RA_PW_VOCs	N	Bromomethane	74-83-9	ug/l									
RA_PW_VOCs	N	Carbon Disulfide	75-15-0	ug/l									
RA_PW_VOCs	N	Carbon Tetrachloride	56-23-5	ug/l									
RA_PW_VOCs	N	Chlorobenzene	108-90-7	ug/l									
RA_PW_VOCs	N	Chloroethane	75-00-3	ug/l									
RA_PW_VOCs	N	Chloroform	67-66-3	ug/l									
RA_PW_VOCs	N	Chloromethane	74-87-3	ug/l									
RA_PW_VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l									
RA_PW_VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l									
RA_PW_VOCs	N	Cyclohexane	110-82-7	ug/l									
RA_PW_VOCs	N	dibromochloromethane	124-48-1	ug/l									
RA_PW_VOCs	N	Dibromomethane	74-95-3	ug/l									
RA_PW_VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l									
RA_PW_VOCs	N	Ethylbenzene	100-41-4	ug/l									
RA_PW_VOCs	N	Freon 113	76-13-1	ug/l									
RA_PW_VOCs	N	Hexachlorobutadiene	87-68-3	ug/l									
RA_PW_VOCs	N	Isopropylbenzene	98-82-8	ug/l									
RA_PW_VOCs	N	M,P-Xylenes	179601-23-1	ug/l									
RA_PW_VOCs	N	Methyl Acetate	79-20-9	ug/l									
RA_PW_VOCs	N	Methylcyclohexane	108-87-2	ug/l									
RA_PW_VOCs	N	Methylene Chloride	75-09-2	ug/l									
RA_PW_VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l									
RA_PW_VOCs	N	Naphthalene	91-20-3	ug/l									
RA_PW_VOCs	N	n-Butylbenzene	104-51-8	ug/l									
RA_PW_VOCs	N	n-Propylbenzene	103-65-1	ug/l									
RA_PW_VOCs	N	O-Xylene	95-47-6	ug/l									
RA_PW_VOCs	N	sec-Butylbenzene	135-98-8	ug/l									
RA_PW_VOCs	N	Styrene	100-42-5	ug/l									
RA_PW_VOCs	N	tert-Butylbenzene	98-06-6	ug/l									
RA_PW_VOCs	N	Tetrachloroethene	127-18-4	ug/l									
RA_PW_VOCs	N	Tetrahydrofuran	109-99-9	ug/l									
RA_PW_VOCs	N	Toluene	108-88-3	ug/l									
RA_PW_VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l									
RA_PW_VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l									
RA_PW_VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l									
RA_PW_VOCs	N	Trichloroethylene	79-01-6	ug/l									
RA_PW_VOCs	N	Trichlorofluoromethane	75-69-4	ug/l									
RA_PW_VOCs	N	Vinyl Acetate	108-05-4	ug/l									
RA_PW_VOCs	N	Vinyl Chloride	75-01-4	ug/l									
RA_PW_VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	1,1-Dichloroethane	75-34-3	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	1,1-Dichloroethene	75-35-4	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	1,1-Dichloropropene	563-58-6	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l	20 U		20 U		20 U		20 U		
RA_PW_VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l	5 U		5 U		5 U		5 U		

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-OFF-5-083115	PW-OFF-5-083115	PW-OFF-6-083115	PW-OFF-6-083115	PW-OFF-7-090115	PW-OFF-7-090115	PW-OFF-8-090115	PW-OFF-8-090115
					Sample Type Code	N	N	N	N	N	N	N	N
					Sample ID	PW-OFF-5-083115	PW-OFF-5F-083115	PW-OFF-6-083115	PW-OFF-6F-083115	PW-OFF-7-090115	PW-OFF-7F-090115	PW-OFF-8-090115	PW-OFF-8F-090115
					Sample Date	8/31/2015	8/31/2015	8/31/2015	8/31/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015
					Depth Interval	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA PW VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,2-Dibromoethane	106-93-4	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,2-Dichloroethane	107-06-2	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,2-Dichloropropane	78-87-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,3-Dichloropropane	142-28-9	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	2,2-Dichloropropane	594-20-7	ug/l	20 U		20 U		20 U		20 U		
RA PW VOCs	T	2-Butanone (MEK)	78-93-3	ug/l	50 U		50 U		50 U		50 U		
RA PW VOCs	T	2-Chlorotoluene	95-49-8	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	2-Hexanone	591-78-6	ug/l	50 U		50 U		50 U		50 U		
RA PW VOCs	T	4-Chlorotoluene	106-43-4	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	4-Isopropyltoluene	99-87-6	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l	20 U		20 U		20 U		20 U		
RA PW VOCs	T	Acetone	67-64-1	ug/l	50 U		50 U		50 U		50 U		
RA PW VOCs	T	Benzene	71-43-2	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Bromobenzene	108-86-1	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Bromochloromethane	74-97-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Bromodichloromethane	75-27-4	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Bromoform	75-25-2	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Bromomethane	74-83-9	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Carbon Disulfide	75-15-0	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Carbon Tetrachloride	56-23-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Chlorobenzene	108-90-7	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Chloroethane	75-00-3	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Chloroform	67-66-3	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Chloromethane	74-87-3	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	dibromochloromethane	124-48-1	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Dibromomethane	74-95-3	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Ethylbenzene	100-41-4	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Hexachlorobutadiene	87-68-3	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Isopropylbenzene	98-82-8	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	M,P-Xylenes	179601-23-1	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Methylene Chloride	75-09-2	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Naphthalene	91-20-3	ug/l	20 U		20 U		20 U		20 U		
RA PW VOCs	T	n-Butylbenzene	104-51-8	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	n-Propylbenzene	103-65-1	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	O-Xylene	95-47-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	sec-Butylbenzene	135-98-8	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Styrene	100-42-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	tert-Butylbenzene	98-06-6	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Tetrachloroethene	127-18-4	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Toluene	108-88-3	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l	15 U		15 U		15 U		15 U		
RA PW VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l	5 U		5 U		5 U		5 U		

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-OFF-5-083115	PW-OFF-5-083115	PW-OFF-6-083115	PW-OFF-6-083115	PW-OFF-7-090115	PW-OFF-7-090115	PW-OFF-8-090115	PW-OFF-8-090115
					Sample Type Code	N	N	N	N	N	N	N	N
					Sample ID	PW-OFF-5-083115	PW-OFF-5F-083115	PW-OFF-6-083115	PW-OFF-6F-083115	PW-OFF-7-090115	PW-OFF-7F-090115	PW-OFF-8-090115	PW-OFF-8F-090115
					Sample Date	8/31/2015	8/31/2015	8/31/2015	8/31/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015
					Depth Interval	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA_PW_VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Trichloroethylene	79-01-6	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Trichlorofluoromethane	75-69-4	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	Vinyl Chloride	75-01-4	ug/l	5 U		5 U		5 U		5 U		

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-OFF-9-090115	PW-OFF-9-090115	PW-ON-10-082515	PW-ON-10-082515	PW-ON-1-082615	PW-ON-1-082615	PW-ON-2-082615	PW-ON-2-082615
					Sample Type Code	N	N	N	N	N	N	N	N
					Sample ID	PW-OFF-9-090115	PW-OFF-9F-090115	PW-ON-10-082515	PW-ON-10F-082515	PW-ON-1-082615	PW-ON-1F-082615	PW-ON-2-082615	PW-ON-2F-082615
					Sample Date	9/1/2015	9/1/2015	8/25/2015	8/25/2015	8/26/2015	8/26/2015	8/26/2015	8/26/2015
					Depth Interval	0.75 - 1 ft	0.75 - 1 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA PW Metals	D	Arsenic	7440-38-2	ug/l		4 U		4 U		10 U		10 U	
RA PW Metals	D	Barium	7440-39-3	ug/l		25 U		25 U		25 U		25 U	
RA PW Metals	D	Cadmium	7440-43-9	ug/l		4 U		4 U		10 U		10 U	
RA PW Metals	D	Chromium	7440-47-3	ug/l		25 U		10 U		25 U		25 U	
RA PW Metals	D	HEXAVALENT CHROMIUM	18540-29-9	ug/l				2.1 U					
RA PW Metals	D	Lead	7439-92-1	ug/l		13 U		13 U		25 U		13 U	
RA PW Metals	D	Mercury	7439-97-6	ug/l		0.15 U		0.15 U		0.15 U		0.15 U	
RA PW Metals	D	Selenium	7782-49-2	ug/l		10 U		10 U		25 U		25 U	
RA PW Metals	D	Silver	7440-22-4	ug/l		13 U		5 U		13 U		13 U	
RA PW Metals	T	Arsenic	7440-38-2	ug/l	4 U		4 U		10 U		10 U		
RA PW Metals	T	Barium	7440-39-3	ug/l	25 U		25 U		25 U		25 U		
RA PW Metals	T	Cadmium	7440-43-9	ug/l	4 U		4 U		10 U		10 U		
RA PW Metals	T	Chromium	7440-47-3	ug/l	25 U		10 U		25 U		25 U		
RA PW Metals	T	HEXAVALENT CHROMIUM	18540-29-9	ug/l			2.1 U						
RA PW Metals	T	Lead	7439-92-1	ug/l	20.8 J		13 U		25 U		25 U		
RA PW Metals	T	Mercury	7439-97-6	ug/l	0.15 U		0.15 U		0.15 U		0.15 U		
RA PW Metals	T	Selenium	7782-49-2	ug/l	10 U		10 U		25 U		26.2 J		
RA PW Metals	T	Silver	7440-22-4	ug/l	13 U		5 U		13 U		13 U		
RA PW VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l									
RA PW VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l									
RA PW VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l									
RA PW VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l									
RA PW VOCs	N	1,1-Dichloroethane	75-34-3	ug/l									
RA PW VOCs	N	1,1-Dichloroethene	75-35-4	ug/l									
RA PW VOCs	N	1,1-Dichloropropene	563-58-6	ug/l									
RA PW VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l									
RA PW VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l									
RA PW VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l									
RA PW VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l									
RA PW VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l									
RA PW VOCs	N	1,2-Dibromoethane	106-93-4	ug/l									
RA PW VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l									
RA PW VOCs	N	1,2-Dichloroethane	107-06-2	ug/l									
RA PW VOCs	N	1,2-Dichloropropane	78-87-5	ug/l									
RA PW VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l									
RA PW VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l									
RA PW VOCs	N	1,3-Dichloropropane	142-28-9	ug/l									
RA PW VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l									
RA PW VOCs	N	1-Chlorohexane	544-10-5	ug/l									
RA PW VOCs	N	2,2-Dichloropropane	594-20-7	ug/l									
RA PW VOCs	N	2-Butanone (MEK)	78-93-3	ug/l									
RA PW VOCs	N	2-Chlorotoluene	95-49-8	ug/l									
RA PW VOCs	N	2-Hexanone	591-78-6	ug/l									
RA PW VOCs	N	4-Chlorotoluene	106-43-4	ug/l									
RA PW VOCs	N	4-Isopropyltoluene	99-87-6	ug/l									
RA PW VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l									
RA PW VOCs	N	Acetone	67-64-1	ug/l									
RA PW VOCs	N	Benzene	71-43-2	ug/l									
RA PW VOCs	N	Bromobenzene	108-86-1	ug/l									
RA PW VOCs	N	Bromochloromethane	74-97-5	ug/l									
RA PW VOCs	N	Bromodichloromethane	75-27-4	ug/l									

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-OFF-9-090115	PW-OFF-9-090115	PW-ON-10-082515	PW-ON-10-082515	PW-ON-1-082615	PW-ON-1-082615	PW-ON-2-082615	PW-ON-2-082615
					Sample Type Code	N	N	N	N	N	N	N	N
					Sample ID	PW-OFF-9-090115	PW-OFF-9F-090115	PW-ON-10-082515	PW-ON-10F-082515	PW-ON-1-082615	PW-ON-1F-082615	PW-ON-2-082615	PW-ON-2F-082615
					Sample Date	9/1/2015	9/1/2015	8/25/2015	8/25/2015	8/26/2015	8/26/2015	8/26/2015	8/26/2015
					Depth Interval	0.75 - 1 ft	0.75 - 1 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA PW VOCs	N	Bromoform	75-25-2	ug/l									
RA PW VOCs	N	Bromomethane	74-83-9	ug/l									
RA PW VOCs	N	Carbon Disulfide	75-15-0	ug/l									
RA PW VOCs	N	Carbon Tetrachloride	56-23-5	ug/l									
RA PW VOCs	N	Chlorobenzene	108-90-7	ug/l									
RA PW VOCs	N	Chloroethane	75-00-3	ug/l									
RA PW VOCs	N	Chloroform	67-66-3	ug/l									
RA PW VOCs	N	Chloromethane	74-87-3	ug/l									
RA PW VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l									
RA PW VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l									
RA PW VOCs	N	Cyclohexane	110-82-7	ug/l									
RA PW VOCs	N	dibromochloromethane	124-48-1	ug/l									
RA PW VOCs	N	Dibromomethane	74-95-3	ug/l									
RA PW VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l									
RA PW VOCs	N	Ethylbenzene	100-41-4	ug/l									
RA PW VOCs	N	Freon 113	76-13-1	ug/l									
RA PW VOCs	N	Hexachlorobutadiene	87-68-3	ug/l									
RA PW VOCs	N	Isopropylbenzene	98-82-8	ug/l									
RA PW VOCs	N	M,P-Xylenes	179601-23-1	ug/l									
RA PW VOCs	N	Methyl Acetate	79-20-9	ug/l									
RA PW VOCs	N	Methylcyclohexane	108-87-2	ug/l									
RA PW VOCs	N	Methylene Chloride	75-09-2	ug/l									
RA PW VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l									
RA PW VOCs	N	Naphthalene	91-20-3	ug/l									
RA PW VOCs	N	n-Butylbenzene	104-51-8	ug/l									
RA PW VOCs	N	n-Propylbenzene	103-65-1	ug/l									
RA PW VOCs	N	O-Xylene	95-47-6	ug/l									
RA PW VOCs	N	sec-Butylbenzene	135-98-8	ug/l									
RA PW VOCs	N	Styrene	100-42-5	ug/l									
RA PW VOCs	N	tert-Butylbenzene	98-06-6	ug/l									
RA PW VOCs	N	Tetrachloroethene	127-18-4	ug/l									
RA PW VOCs	N	Tetrahydrofuran	109-99-9	ug/l									
RA PW VOCs	N	Toluene	108-88-3	ug/l									
RA PW VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l									
RA PW VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l									
RA PW VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l									
RA PW VOCs	N	Trichloroethylene	79-01-6	ug/l									
RA PW VOCs	N	Trichlorofluoromethane	75-69-4	ug/l									
RA PW VOCs	N	Vinyl Acetate	108-05-4	ug/l									
RA PW VOCs	N	Vinyl Chloride	75-01-4	ug/l									
RA PW VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1-Dichloroethane	75-34-3	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1-Dichloroethene	75-35-4	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1-Dichloropropene	563-58-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l	20 U		20 U		20 U		20 U		
RA PW VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l	5 U		5 U		5 U		5 U		

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-OFF-9-090115	PW-OFF-9-090115	PW-ON-10-082515	PW-ON-10-082515	PW-ON-1-082615	PW-ON-1-082615	PW-ON-2-082615	PW-ON-2-082615
					Sample Type Code	N	N	N	N	N	N	N	N
					Sample ID	PW-OFF-9-090115	PW-OFF-9F-090115	PW-ON-10-082515	PW-ON-10F-082515	PW-ON-1-082615	PW-ON-1F-082615	PW-ON-2-082615	PW-ON-2F-082615
					Sample Date	9/1/2015	9/1/2015	8/25/2015	8/25/2015	8/26/2015	8/26/2015	8/26/2015	8/26/2015
					Depth Interval	0.75 - 1 ft	0.75 - 1 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA_PW_VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	1,2-Dibromoethane	106-93-4	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	1,2-Dichloroethane	107-06-2	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	1,2-Dichloropropane	78-87-5	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	1,3-Dichloropropane	142-28-9	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	2,2-Dichloropropane	594-20-7	ug/l	20 U		20 U		20 U		20 U		
RA_PW_VOCs	T	2-Butanone (MEK)	78-93-3	ug/l	50 U		50 U		50 U		50 U		
RA_PW_VOCs	T	2-Chlorotoluene	95-49-8	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	2-Hexanone	591-78-6	ug/l	50 U		50 U		50 U		50 U		
RA_PW_VOCs	T	4-Chlorotoluene	106-43-4	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	4-Isopropyltoluene	99-87-6	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l	20 U		20 U		20 U		20 U		
RA_PW_VOCs	T	Acetone	67-64-1	ug/l	50 U		50 U		50 U		50 U		
RA_PW_VOCs	T	Benzene	71-43-2	ug/l	5 U		7 J		5 U		5 U		
RA_PW_VOCs	T	Bromobenzene	108-86-1	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	Bromochloromethane	74-97-5	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Bromodichloromethane	75-27-4	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Bromoform	75-25-2	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Bromomethane	74-83-9	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	Carbon Disulfide	75-15-0	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Carbon Tetrachloride	56-23-5	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Chlorobenzene	108-90-7	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Chloroethane	75-00-3	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Chloroform	67-66-3	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Chloromethane	74-87-3	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	dibromochloromethane	124-48-1	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Dibromomethane	74-95-3	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	Ethylbenzene	100-41-4	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Hexachlorobutadiene	87-68-3	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	Isopropylbenzene	98-82-8	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	M,P-Xylenes	179601-23-1	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	Methylene Chloride	75-09-2	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Naphthalene	91-20-3	ug/l	20 U		20 U		20 U		20 U		
RA_PW_VOCs	T	n-Butylbenzene	104-51-8	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	n-Propylbenzene	103-65-1	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	O-Xylene	95-47-6	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	sec-Butylbenzene	135-98-8	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	Styrene	100-42-5	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	tert-Butylbenzene	98-06-6	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	Tetrachloroethene	127-18-4	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Toluene	108-88-3	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l	15 U		15 U		15 U		15 U		
RA_PW_VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l	5 U		5 U		5 U		5 U		

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location Group												
Location ID					PW-OFF-9-090115	PW-OFF-9-090115	PW-ON-10-082515	PW-ON-10-082515	PW-ON-1-082615	PW-ON-1F-082615	PW-ON-2-082615	PW-ON-2F-082615
Sample Type Code					N	N	N	N	N	N	N	N
Sample ID					PW-OFF-9-090115	PW-OFF-9F-090115	PW-ON-10-082515	PW-ON-10F-082515	PW-ON-1-082615	PW-ON-1F-082615	PW-ON-2-082615	PW-ON-2F-082615
Sample Date					9/1/2015	9/1/2015	8/25/2015	8/25/2015	8/26/2015	8/26/2015	8/26/2015	8/26/2015
Depth Interval					0.75 - 1 ft	0.75 - 1 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA_PW_VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Trichloroethylene	79-01-6	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Trichlorofluoromethane	75-69-4	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	Vinyl Chloride	75-01-4	ug/l	5 U		5 U		5 U		5 U	

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-ON-3-082615	PW-ON-3-082615	PW-ON-4-082715	PW-ON-4-082715	PW-ON-5-082715	PW-ON-5-082715	PW-ON-5-082715	PW-ON-5-082715
					Sample Type Code	N	N	N	N	N	N	FD	FD
					Sample ID	PW-ON-3-082615	PW-ON-3F-082615	PW-ON-4-082715	PW-ON-4F-082715	PW-ON-5-082715	PW-ON-5F-082715	PW-ON-59X-082715	PW-ON-59XF-082715
					Sample Date	8/26/2015	8/26/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015
					Depth Interval	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA PW Metals	D	Arsenic	7440-38-2	ug/l		10 U		6.1 J		4 U		4 J
RA PW Metals	D	Barium	7440-39-3	ug/l		25 U		25 U		25 U		25 U
RA PW Metals	D	Cadmium	7440-43-9	ug/l		10 U		4 U		4 U		4 U
RA PW Metals	D	Chromium	7440-47-3	ug/l		25 U		10 U		10 U		10 U
RA PW Metals	D	HEXAVALENT CHROMIUM	18540-29-9	ug/l								
RA PW Metals	D	Lead	7439-92-1	ug/l		25 U		25 U		13 U		13 U
RA PW Metals	D	Mercury	7439-97-6	ug/l		0.15 U		0.15 U		0.15 U		0.15 U
RA PW Metals	D	Selenium	7782-49-2	ug/l		25 U		38.4 J		17 J		25 U
RA PW Metals	D	Silver	7440-22-4	ug/l		13 U		13 U		5 U		5 U
RA PW Metals	T	Arsenic	7440-38-2	ug/l	10 U		10 U		4.3 J		4 U	
RA PW Metals	T	Barium	7440-39-3	ug/l	25 U		25 U		25 U		25 U	
RA PW Metals	T	Cadmium	7440-43-9	ug/l	10 U		10 U		4 U		4 U	
RA PW Metals	T	Chromium	7440-47-3	ug/l	25 U		25 U		10 U		10 U	
RA PW Metals	T	HEXAVALENT CHROMIUM	18540-29-9	ug/l								
RA PW Metals	T	Lead	7439-92-1	ug/l	25 U		13 U		13 U		13 U	
RA PW Metals	T	Mercury	7439-97-6	ug/l	0.15 U		0.15 U		0.15 U		0.15 U	
RA PW Metals	T	Selenium	7782-49-2	ug/l	25 U		26.5 J		22.7		17.5 J	
RA PW Metals	T	Silver	7440-22-4	ug/l	13 U		13 U		5 U		5 U	
RA PW VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l								
RA PW VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l								
RA PW VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l								
RA PW VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l								
RA PW VOCs	N	1,1-Dichloroethane	75-34-3	ug/l								
RA PW VOCs	N	1,1-Dichloroethene	75-35-4	ug/l								
RA PW VOCs	N	1,1-Dichloropropene	563-58-6	ug/l								
RA PW VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l								
RA PW VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l								
RA PW VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l								
RA PW VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l								
RA PW VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l								
RA PW VOCs	N	1,2-Dibromoethane	106-93-4	ug/l								
RA PW VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l								
RA PW VOCs	N	1,2-Dichloroethane	107-06-2	ug/l								
RA PW VOCs	N	1,2-Dichloropropane	78-87-5	ug/l								
RA PW VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l								
RA PW VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l								
RA PW VOCs	N	1,3-Dichloropropane	142-28-9	ug/l								
RA PW VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l								
RA PW VOCs	N	1-Chlorohexane	544-10-5	ug/l								
RA PW VOCs	N	2,2-Dichloropropane	594-20-7	ug/l								
RA PW VOCs	N	2-Butanone (MEK)	78-93-3	ug/l								
RA PW VOCs	N	2-Chlorotoluene	95-49-8	ug/l								
RA PW VOCs	N	2-Hexanone	591-78-6	ug/l								
RA PW VOCs	N	4-Chlorotoluene	106-43-4	ug/l								
RA PW VOCs	N	4-Isopropyltoluene	99-87-6	ug/l								
RA PW VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l								
RA PW VOCs	N	Acetone	67-64-1	ug/l								
RA PW VOCs	N	Benzene	71-43-2	ug/l								
RA PW VOCs	N	Bromobenzene	108-86-1	ug/l								
RA PW VOCs	N	Bromochloromethane	74-97-5	ug/l								
RA PW VOCs	N	Bromodichloromethane	75-27-4	ug/l								

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-ON-3-082615	PW-ON-3-082615	PW-ON-4-082715	PW-ON-4-082715	PW-ON-5-082715	PW-ON-5-082715	PW-ON-5-082715	PW-ON-5-082715
					Sample Type Code	N	N	N	N	N	N	FD	FD
					Sample ID	PW-ON-3-082615	PW-ON-3F-082615	PW-ON-4-082715	PW-ON-4F-082715	PW-ON-5-082715	PW-ON-5F-082715	PW-ON-59X-082715	PW-ON-59XF-082715
					Sample Date	8/26/2015	8/26/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015
					Depth Interval	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA PW VOCs	N	Bromoform	75-25-2	ug/l									
RA PW VOCs	N	Bromomethane	74-83-9	ug/l									
RA PW VOCs	N	Carbon Disulfide	75-15-0	ug/l									
RA PW VOCs	N	Carbon Tetrachloride	56-23-5	ug/l									
RA PW VOCs	N	Chlorobenzene	108-90-7	ug/l									
RA PW VOCs	N	Chloroethane	75-00-3	ug/l									
RA PW VOCs	N	Chloroform	67-66-3	ug/l									
RA PW VOCs	N	Chloromethane	74-87-3	ug/l									
RA PW VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l									
RA PW VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l									
RA PW VOCs	N	Cyclohexane	110-82-7	ug/l									
RA PW VOCs	N	dibromochloromethane	124-48-1	ug/l									
RA PW VOCs	N	Dibromomethane	74-95-3	ug/l									
RA PW VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l									
RA PW VOCs	N	Ethylbenzene	100-41-4	ug/l									
RA PW VOCs	N	Freon 113	76-13-1	ug/l									
RA PW VOCs	N	Hexachlorobutadiene	87-68-3	ug/l									
RA PW VOCs	N	Isopropylbenzene	98-82-8	ug/l									
RA PW VOCs	N	M,P-Xylenes	179601-23-1	ug/l									
RA PW VOCs	N	Methyl Acetate	79-20-9	ug/l									
RA PW VOCs	N	Methylcyclohexane	108-87-2	ug/l									
RA PW VOCs	N	Methylene Chloride	75-09-2	ug/l									
RA PW VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l									
RA PW VOCs	N	Naphthalene	91-20-3	ug/l									
RA PW VOCs	N	n-Butylbenzene	104-51-8	ug/l									
RA PW VOCs	N	n-Propylbenzene	103-65-1	ug/l									
RA PW VOCs	N	O-Xylene	95-47-6	ug/l									
RA PW VOCs	N	sec-Butylbenzene	135-98-8	ug/l									
RA PW VOCs	N	Styrene	100-42-5	ug/l									
RA PW VOCs	N	tert-Butylbenzene	98-06-6	ug/l									
RA PW VOCs	N	Tetrachloroethene	127-18-4	ug/l									
RA PW VOCs	N	Tetrahydrofuran	109-99-9	ug/l									
RA PW VOCs	N	Toluene	108-88-3	ug/l									
RA PW VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l									
RA PW VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l									
RA PW VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l									
RA PW VOCs	N	Trichloroethylene	79-01-6	ug/l									
RA PW VOCs	N	Trichlorofluoromethane	75-69-4	ug/l									
RA PW VOCs	N	Vinyl Acetate	108-05-4	ug/l									
RA PW VOCs	N	Vinyl Chloride	75-01-4	ug/l									
RA PW VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1-Dichloroethane	75-34-3	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1-Dichloroethene	75-35-4	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1-Dichloropropene	563-58-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l	20 U		20 U		20 U		20 U		
RA PW VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l	5 U		5 U		5 U		5 U		

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-ON-3-082615	PW-ON-3-082615	PW-ON-4-082715	PW-ON-4-082715	PW-ON-5-082715	PW-ON-5-082715	PW-ON-5-082715	PW-ON-5-082715
					Sample Type Code	N	N	N	N	N	N	FD	FD
					Sample ID	PW-ON-3-082615	PW-ON-3F-082615	PW-ON-4-082715	PW-ON-4F-082715	PW-ON-5-082715	PW-ON-5F-082715	PW-ON-59X-082715	PW-ON-59XF-082715
					Sample Date	8/26/2015	8/26/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015
					Depth Interval	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA PW VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,2-Dibromoethane	106-93-4	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,2-Dichloroethane	107-06-2	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,2-Dichloropropane	78-87-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,3-Dichloropropane	142-28-9	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	2,2-Dichloropropane	594-20-7	ug/l	20 U		20 U		20 U		20 U		
RA PW VOCs	T	2-Butanone (MEK)	78-93-3	ug/l	50 U		50 U		50 U		50 U		
RA PW VOCs	T	2-Chlorotoluene	95-49-8	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	2-Hexanone	591-78-6	ug/l	50 U		50 U		50 U		50 U		
RA PW VOCs	T	4-Chlorotoluene	106-43-4	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	4-Isopropyltoluene	99-87-6	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l	20 U		20 U		20 U		20 U		
RA PW VOCs	T	Acetone	67-64-1	ug/l	50 U		50 U		50 U		50 U		
RA PW VOCs	T	Benzene	71-43-2	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Bromobenzene	108-86-1	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Bromochloromethane	74-97-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Bromodichloromethane	75-27-4	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Bromoform	75-25-2	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Bromomethane	74-83-9	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Carbon Disulfide	75-15-0	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Carbon Tetrachloride	56-23-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Chlorobenzene	108-90-7	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Chloroethane	75-00-3	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Chloroform	67-66-3	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Chloromethane	74-87-3	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	dibromochloromethane	124-48-1	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Dibromomethane	74-95-3	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Ethylbenzene	100-41-4	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Hexachlorobutadiene	87-68-3	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Isopropylbenzene	98-82-8	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	M,P-Xylenes	179601-23-1	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Methylene Chloride	75-09-2	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Naphthalene	91-20-3	ug/l	20 U		20 U		20 U		20 U		
RA PW VOCs	T	n-Butylbenzene	104-51-8	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	n-Propylbenzene	103-65-1	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	O-Xylene	95-47-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	sec-Butylbenzene	135-98-8	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Styrene	100-42-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	tert-Butylbenzene	98-06-6	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	Tetrachloroethene	127-18-4	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Toluene	108-88-3	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l	15 U		15 U		15 U		15 U		
RA PW VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l	5 U		5 U		5 U		5 U		

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-ON-3-082615	PW-ON-3-082615	PW-ON-4-082715	PW-ON-4-082715	PW-ON-5-082715	PW-ON-5-082715	PW-ON-5-082715	PW-ON-5-082715
					Sample Type Code	N	N	N	N	N	N	FD	FD
					Sample ID	PW-ON-3-082615	PW-ON-3F-082615	PW-ON-4-082715	PW-ON-4F-082715	PW-ON-5-082715	PW-ON-5F-082715	PW-ON-59X-082715	PW-ON-59XF-082715
					Sample Date	8/26/2015	8/26/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015
					Depth Interval	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA_PW_VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Trichloroethylene	79-01-6	ug/l	5 U		5 U		5 U		5 U		
RA_PW_VOCs	T	Trichlorofluoromethane	75-69-4	ug/l	10 U		10 U		10 U		10 U		
RA_PW_VOCs	T	Vinyl Chloride	75-01-4	ug/l	5 U		5 U		5 U		5 U		

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-ON-6-082715	PW-ON-6-082715	PW-ON-7-082715	PW-ON-7-082715	PW-ON-8-082715	PW-ON-8-082715	PW-ON-9-082515	PW-ON-9-082515
					Sample Type Code	N	N	N	N	N	N	N	N
					Sample ID	PW-ON-6-082715	PW-ON-6F-082715	PW-ON-7-082715	PW-ON-7F-082715	PW-ON-8-082715	PW-ON-8F-082715	PW-ON-9-082515	PW-ON-9F-082515
					Sample Date	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/25/2015	8/25/2015
					Depth Interval	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA PW Metals	D	Arsenic	7440-38-2	ug/l		10 U		10 U		10 U		4 J
RA PW Metals	D	Barium	7440-39-3	ug/l		25 U		25 U		25 U		25 U
RA PW Metals	D	Cadmium	7440-43-9	ug/l		10 U		10 U		10 U		4 U
RA PW Metals	D	Chromium	7440-47-3	ug/l		25 U		25 U		25 U		10 U
RA PW Metals	D	HEXAVALENT CHROMIUM	18540-29-9	ug/l								2.1 U
RA PW Metals	D	Lead	7439-92-1	ug/l		25 U		25 U		25 U		13 U
RA PW Metals	D	Mercury	7439-97-6	ug/l		0.15 U		0.15 U		0.15 U		0.15 U
RA PW Metals	D	Selenium	7782-49-2	ug/l		25.1 J		25 U		25 U		10 U
RA PW Metals	D	Silver	7440-22-4	ug/l		13 U		13 U		13 U		5 U
RA PW Metals	T	Arsenic	7440-38-2	ug/l	10 U		10 U		10 U		4 U	
RA PW Metals	T	Barium	7440-39-3	ug/l	25 U		25 U		25 U		25 U	
RA PW Metals	T	Cadmium	7440-43-9	ug/l	10 U		10 U		10 U		4 U	
RA PW Metals	T	Chromium	7440-47-3	ug/l	25 U		25 U		25 U		10 U	
RA PW Metals	T	HEXAVALENT CHROMIUM	18540-29-9	ug/l							2.1 U	
RA PW Metals	T	Lead	7439-92-1	ug/l	13 U		25 U		25 U		13 U	
RA PW Metals	T	Mercury	7439-97-6	ug/l	0.15 U		0.15 U		0.15 U		0.15 U	
RA PW Metals	T	Selenium	7782-49-2	ug/l	30.4 J		25 U		25.3 J		10 U	
RA PW Metals	T	Silver	7440-22-4	ug/l	13 U		13 U		13 U		5 U	
RA PW VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l								
RA PW VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l								
RA PW VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l								
RA PW VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l								
RA PW VOCs	N	1,1-Dichloroethane	75-34-3	ug/l								
RA PW VOCs	N	1,1-Dichloroethene	75-35-4	ug/l								
RA PW VOCs	N	1,1-Dichloropropene	563-58-6	ug/l								
RA PW VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l								
RA PW VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l								
RA PW VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l								
RA PW VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l								
RA PW VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l								
RA PW VOCs	N	1,2-Dibromoethane	106-93-4	ug/l								
RA PW VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l								
RA PW VOCs	N	1,2-Dichloroethane	107-06-2	ug/l								
RA PW VOCs	N	1,2-Dichloropropane	78-87-5	ug/l								
RA PW VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l								
RA PW VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l								
RA PW VOCs	N	1,3-Dichloropropane	142-28-9	ug/l								
RA PW VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l								
RA PW VOCs	N	1-Chlorohexane	544-10-5	ug/l								
RA PW VOCs	N	2,2-Dichloropropane	594-20-7	ug/l								
RA PW VOCs	N	2-Butanone (MEK)	78-93-3	ug/l								
RA PW VOCs	N	2-Chlorotoluene	95-49-8	ug/l								
RA PW VOCs	N	2-Hexanone	591-78-6	ug/l								
RA PW VOCs	N	4-Chlorotoluene	106-43-4	ug/l								
RA PW VOCs	N	4-Isopropyltoluene	99-87-6	ug/l								
RA PW VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l								
RA PW VOCs	N	Acetone	67-64-1	ug/l								
RA PW VOCs	N	Benzene	71-43-2	ug/l								
RA PW VOCs	N	Bromobenzene	108-86-1	ug/l								
RA PW VOCs	N	Bromochloromethane	74-97-5	ug/l								
RA PW VOCs	N	Bromodichloromethane	75-27-4	ug/l								

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
					Location ID	PW-ON-6-082715	PW-ON-6-082715	PW-ON-7-082715	PW-ON-7-082715	PW-ON-8-082715	PW-ON-8-082715	PW-ON-9-082515	PW-ON-9-082515
					Sample Type Code	N	N	N	N	N	N	N	N
					Sample ID	PW-ON-6-082715	PW-ON-6F-082715	PW-ON-7-082715	PW-ON-7F-082715	PW-ON-8-082715	PW-ON-8F-082715	PW-ON-9-082515	PW-ON-9F-082515
					Sample Date	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/25/2015	8/25/2015
					Depth Interval	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft
Method Analyte Group	Fraction	Compound	CAS #	Units									
RA PW VOCs	N	Bromoform	75-25-2	ug/l									
RA PW VOCs	N	Bromomethane	74-83-9	ug/l									
RA PW VOCs	N	Carbon Disulfide	75-15-0	ug/l									
RA PW VOCs	N	Carbon Tetrachloride	56-23-5	ug/l									
RA PW VOCs	N	Chlorobenzene	108-90-7	ug/l									
RA PW VOCs	N	Chloroethane	75-00-3	ug/l									
RA PW VOCs	N	Chloroform	67-66-3	ug/l									
RA PW VOCs	N	Chloromethane	74-87-3	ug/l									
RA PW VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l									
RA PW VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l									
RA PW VOCs	N	Cyclohexane	110-82-7	ug/l									
RA PW VOCs	N	dibromochloromethane	124-48-1	ug/l									
RA PW VOCs	N	Dibromomethane	74-95-3	ug/l									
RA PW VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l									
RA PW VOCs	N	Ethylbenzene	100-41-4	ug/l									
RA PW VOCs	N	Freon 113	76-13-1	ug/l									
RA PW VOCs	N	Hexachlorobutadiene	87-68-3	ug/l									
RA PW VOCs	N	Isopropylbenzene	98-82-8	ug/l									
RA PW VOCs	N	M,P-Xylenes	179601-23-1	ug/l									
RA PW VOCs	N	Methyl Acetate	79-20-9	ug/l									
RA PW VOCs	N	Methylcyclohexane	108-87-2	ug/l									
RA PW VOCs	N	Methylene Chloride	75-09-2	ug/l									
RA PW VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l									
RA PW VOCs	N	Naphthalene	91-20-3	ug/l									
RA PW VOCs	N	n-Butylbenzene	104-51-8	ug/l									
RA PW VOCs	N	n-Propylbenzene	103-65-1	ug/l									
RA PW VOCs	N	O-Xylene	95-47-6	ug/l									
RA PW VOCs	N	sec-Butylbenzene	135-98-8	ug/l									
RA PW VOCs	N	Styrene	100-42-5	ug/l									
RA PW VOCs	N	tert-Butylbenzene	98-06-6	ug/l									
RA PW VOCs	N	Tetrachloroethene	127-18-4	ug/l									
RA PW VOCs	N	Tetrahydrofuran	109-99-9	ug/l									
RA PW VOCs	N	Toluene	108-88-3	ug/l									
RA PW VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l									
RA PW VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l									
RA PW VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l									
RA PW VOCs	N	Trichloroethylene	79-01-6	ug/l									
RA PW VOCs	N	Trichlorofluoromethane	75-69-4	ug/l									
RA PW VOCs	N	Vinyl Acetate	108-05-4	ug/l									
RA PW VOCs	N	Vinyl Chloride	75-01-4	ug/l									
RA PW VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1-Dichloroethane	75-34-3	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,1-Dichloroethene	75-35-4	ug/l	5 U		5 U		5 U		9.7 J		
RA PW VOCs	T	1,1-Dichloropropene	563-58-6	ug/l	5 U		5 U		5 U		5 U		
RA PW VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l	20 U		20 U		20 U		20 U		
RA PW VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l	10 U		10 U		10 U		10 U		
RA PW VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l	5 U		5 U		5 U		5 U		

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location Group					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location ID					PW-ON-6-082715	PW-ON-6-082715	PW-ON-7-082715	PW-ON-7-082715	PW-ON-8-082715	PW-ON-8-082715	PW-ON-9-082515	PW-ON-9-082515
Sample Type Code					N	N	N	N	N	N	N	N
Sample ID					PW-ON-6-082715	PW-ON-6F-082715	PW-ON-7-082715	PW-ON-7F-082715	PW-ON-8-082715	PW-ON-8F-082715	PW-ON-9-082515	PW-ON-9F-082515
Sample Date					8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/25/2015	8/25/2015
Depth Interval					1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA_PW_VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	1,2-Dibromoethane	106-93-4	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	1,2-Dichloroethane	107-06-2	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	1,2-Dichloropropane	78-87-5	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	1,3-Dichloropropane	142-28-9	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	2,2-Dichloropropane	594-20-7	ug/l	20 U		20 U		20 U		20 U	
RA_PW_VOCs	T	2-Butanone (MEK)	78-93-3	ug/l	50 U		50 U		50 U		50 U	
RA_PW_VOCs	T	2-Chlorotoluene	95-49-8	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	2-Hexanone	591-78-6	ug/l	50 U		50 U		50 U		50 U	
RA_PW_VOCs	T	4-Chlorotoluene	106-43-4	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	4-Isopropyltoluene	99-87-6	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l	20 U		20 U		20 U		20 U	
RA_PW_VOCs	T	Acetone	67-64-1	ug/l	50 U		50 U		50 U		50 U	
RA_PW_VOCs	T	Benzene	71-43-2	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Bromobenzene	108-86-1	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	Bromochloromethane	74-97-5	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Bromodichloromethane	75-27-4	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Bromoform	75-25-2	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Bromomethane	74-83-9	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	Carbon Disulfide	75-15-0	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Carbon Tetrachloride	56-23-5	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Chlorobenzene	108-90-7	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Chloroethane	75-00-3	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Chloroform	67-66-3	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Chloromethane	74-87-3	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	dibromochloromethane	124-48-1	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Dibromomethane	74-95-3	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	Ethylbenzene	100-41-4	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Hexachlorobutadiene	87-68-3	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	Isopropylbenzene	98-82-8	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	M,P-Xylenes	179601-23-1	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	Methylene Chloride	75-09-2	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Naphthalene	91-20-3	ug/l	20 U		20 U		20 U		20 U	
RA_PW_VOCs	T	n-Butylbenzene	104-51-8	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	n-Propylbenzene	103-65-1	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	O-Xylene	95-47-6	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	sec-Butylbenzene	135-98-8	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	Styrene	100-42-5	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	tert-Butylbenzene	98-06-6	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	Tetrachloroethene	127-18-4	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Toluene	108-88-3	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l	15 U		15 U		15 U		15 U	
RA_PW_VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l	5 U		5 U		5 U		5 U	

ATTACHMENT A, TABLE A-4B
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location Group												
Location ID					PW-ON-6-082715	PW-ON-6-082715	PW-ON-7-082715	PW-ON-7-082715	PW-ON-8-082715	PW-ON-8-082715	PW-ON-9-082515	PW-ON-9-082515
Sample Type Code					N	N	N	N	N	N	N	N
Sample ID					PW-ON-6-082715	PW-ON-6F-082715	PW-ON-7-082715	PW-ON-7F-082715	PW-ON-8-082715	PW-ON-8F-082715	PW-ON-9-082515	PW-ON-9F-082515
Sample Date					8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/27/2015	8/25/2015	8/25/2015
Depth Interval					1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft	1 - 1.25 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA_PW_VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Trichloroethylene	79-01-6	ug/l	5 U		5 U		5 U		5 U	
RA_PW_VOCs	T	Trichlorofluoromethane	75-69-4	ug/l	10 U		10 U		10 U		10 U	
RA_PW_VOCs	T	Vinyl Chloride	75-01-4	ug/l	5 U		5 U		5 U		5 U	

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location Group		Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID		PW-1	PW-101	PW-101	PW-102	PW-102	PW-102
			Sample Type Code		N	N	N	N	N	FD
			Sample ID		PW-1-102908	PW-101A 1 - 11-28-2011	PW-101A 1 F - 11-28-2011	PW-102A 1 -11-28-2011	PW-102A 1 F - 11-28-2011	PW-102A-D 1 - 11-28-2011
			Sample Date		10/29/2008	11/28/2011	11/28/2011	11/28/2011	11/28/2011	11/28/2011
			Depth Interval		0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units						
RA PW Metals	D	Arsenic	7440-38-2	ug/l			2.5 U		2.5 U	
RA PW Metals	D	Barium	7440-39-3	ug/l			9.4 J		18.4 J	
RA PW Metals	D	Cadmium	7440-43-9	ug/l			0.12 U		0.12 U	
RA PW Metals	D	Chromium	7440-47-3	ug/l			10 U		10 U	
RA PW Metals	D	Lead	7439-92-1	ug/l			2.5 U		2.5 U	
RA PW Metals	D	Mercury	7439-97-6	ug/l			0.2 U		0.2 U	
RA PW Metals	D	Selenium	7782-49-2	ug/l			5 UJ		5 UJ	
RA PW Metals	D	Silver	7440-22-4	ug/l			0.25 U		0.25 U	
RA PW Metals	T	Arsenic	7440-38-2	ug/l		2.5 U		2.5 U		0.7 J
RA PW Metals	T	Barium	7440-39-3	ug/l		9.8 J		19.1 J		18.2 J
RA PW Metals	T	Cadmium	7440-43-9	ug/l		0.12 U		0.12 U		0.12 U
RA PW Metals	T	Chromium	7440-47-3	ug/l		10 U		10 U		10 U
RA PW Metals	T	Lead	7439-92-1	ug/l		2.5 U		2.5 U		2.5 U
RA PW Metals	T	Mercury	7439-97-6	ug/l		0.2 U		0.2 U		0.2 U
RA PW Metals	T	Selenium	7782-49-2	ug/l		5 UJ		5 UJ		5 UJ
RA PW Metals	T	Silver	7440-22-4	ug/l		0.25 U		0.25 U		0.25 U
RA PW PCBs	D	Aroclor 1016	12674-11-2	ug/l			0.11 U		0.11 U	
RA PW PCBs	D	Aroclor 1221	11104-28-2	ug/l			0.11 U		0.11 U	
RA PW PCBs	D	Aroclor 1232	11141-16-5	ug/l			0.11 U		0.11 U	
RA PW PCBs	D	Aroclor 1242	53469-21-9	ug/l			0.11 U		0.11 U	
RA PW PCBs	D	Aroclor 1248	12672-29-6	ug/l			0.11 U		0.11 U	
RA PW PCBs	D	Aroclor 1254	11097-69-1	ug/l			0.11 U		0.11 U	
RA PW PCBs	D	Aroclor 1260	11096-82-5	ug/l			0.11 U		0.11 U	
RA PW PCBs	D	Aroclor 1262	37324-23-5	ug/l			0.11 U		0.11 U	
RA PW PCBs	D	Aroclor 1268	11100-14-4	ug/l			0.11 U		0.11 U	
RA PW PCBs	D	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l			0.99 U		0.99 U	
RA PW PCBs	N	Aroclor 1016	12674-11-2	ug/l		0.11 U		0.11 U		0.11 U
RA PW PCBs	N	Aroclor 1221	11104-28-2	ug/l		0.11 U		0.11 U		0.11 U
RA PW PCBs	N	Aroclor 1232	11141-16-5	ug/l		0.11 U		0.11 U		0.11 U
RA PW PCBs	N	Aroclor 1242	53469-21-9	ug/l		0.11 U		0.11 U		0.11 U
RA PW PCBs	N	Aroclor 1248	12672-29-6	ug/l		0.11 U		0.11 U		0.11 U
RA PW PCBs	N	Aroclor 1254	11097-69-1	ug/l		0.11 U		0.11 U		0.11 U
RA PW PCBs	N	Aroclor 1260	11096-82-5	ug/l		0.11 U		0.11 U		0.11 U
RA PW PCBs	N	Aroclor 1262	37324-23-5	ug/l		0.11 U		0.11 U		0.11 U
RA PW PCBs	N	Aroclor 1268	11100-14-4	ug/l		0.11 U		0.11 U		0.11 U
RA PW PCBs	N	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l		0.99 U		0.99 U		0.99 U
RA PW VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.5 U	0.5 U		0.5 U		0.5 U
RA PW VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,1-Dichloroethane	75-34-3	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,1-Dichloroethene	75-35-4	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,1-Dichloropropene	563-58-6	ug/l	2 U	2 U		2 U		2 U
RA PW VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	5 U	5 U		5 U		5 U
RA PW VOCs	N	1,2-Dibromoethane	106-93-4	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,2-Dichloroethane	107-06-2	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,2-Dichloropropane	78-87-5	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l	1 U	1 U		1 U		1 U

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location Group		Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID		PW-1	PW-101	PW-101	PW-102	PW-102	PW-102
			Sample Type Code		N	N	N	N	N	FD
			Sample ID		PW-1-102908	PW-101A 1 - 11-28-2011	PW-101A 1 F - 11-28-2011	PW-102A 1 -11-28-2011	PW-102A 1 F - 11-28-2011	PW-102A-D 1 - 11-28-2011
			Sample Date		10/29/2008	11/28/2011	11/28/2011	11/28/2011	11/28/2011	11/28/2011
			Depth Interval		0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units						
RA PW VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,3-Dichloropropane	142-28-9	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	1-Chlorohexane	544-10-5	ug/l	1 U					
RA PW VOCs	N	2,2-Dichloropropane	594-20-7	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	2-Butanone (MEK)	78-93-3	ug/l	25 U	10 U		10 U		10 U
RA PW VOCs	N	2-Chlorotoluene	95-49-8	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	2-Hexanone	591-78-6	ug/l	10 U	10 U		10 U		10 U
RA PW VOCs	N	4-Chlorotoluene	106-43-4	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	4-Isopropyltoluene	99-87-6	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l	25 U	10 U		10 U		10 U
RA PW VOCs	N	Acetone	67-64-1	ug/l	25 U	10 U		10 U		10 U
RA PW VOCs	N	Benzene	71-43-2	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Bromobenzene	108-86-1	ug/l	2 U	2 U		2 U		2 U
RA PW VOCs	N	Bromochloromethane	74-97-5	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Bromodichloromethane	75-27-4	ug/l	0.6 U	0.6 U		0.6 U		0.6 U
RA PW VOCs	N	Bromoform	75-25-2	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Bromomethane	74-83-9	ug/l	2 U	2 U		2 U		2 U
RA PW VOCs	N	Carbon Disulfide	75-15-0	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Carbon Tetrachloride	56-23-5	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Chlorobenzene	108-90-7	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Chloroethane	75-00-3	ug/l	2 U	2 U		2 U		2 U
RA PW VOCs	N	Chloroform	67-66-3	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Chloromethane	74-87-3	ug/l	2 U	2 U		2 U		2 U
RA PW VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.4 U	0.4 U		0.4 U		0.4 U
RA PW VOCs	N	Cyclohexane	110-82-7	ug/l	5 U					
RA PW VOCs	N	dibromochloromethane	124-48-1	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Dibromomethane	74-95-3	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l	2 U	2 U		2 U		2 U
RA PW VOCs	N	Ethylbenzene	100-41-4	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Freon 113	76-13-1	ug/l	1 U					
RA PW VOCs	N	Hexachlorobutadiene	87-68-3	ug/l	0.6 U	0.6 U		0.6 U		0.6 U
RA PW VOCs	N	Isopropylbenzene	98-82-8	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	M,P-Xylenes	179601-23-1	ug/l	2 U	2 U		2 U		2 U
RA PW VOCs	N	Methyl Acetate	79-20-9	ug/l	5 U					
RA PW VOCs	N	Methylcyclohexane	108-87-2	ug/l	1 U					
RA PW VOCs	N	Methylene Chloride	75-09-2	ug/l	4 U	2 U		2 U		2 U
RA PW VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Naphthalene	91-20-3	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	n-Butylbenzene	104-51-8	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	n-Propylbenzene	103-65-1	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	O-Xylene	95-47-6	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	sec-Butylbenzene	135-98-8	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Styrene	100-42-5	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	tert-Butylbenzene	98-06-6	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Tetrachloroethene	127-18-4	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Tetrahydrofuran	109-99-9	ug/l	5 U					
RA PW VOCs	N	Toluene	108-88-3	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l	3.0 U	3.0 U		3.0 U		3.0 U
RA PW VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.5 U	0.4 U		0.4 U		0.4 U
RA PW VOCs	N	Trichloroethylene	79-01-6	ug/l	1 U	1 U		1 U		1 U

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location Group		Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID		PW-1	PW-101	PW-101	PW-102	PW-102	PW-102
			Sample Type Code		N	N	N	N	N	FD
			Sample ID		PW-1-102908	PW-101A 1 - 11-28-2011	PW-101A 1 F - 11-28-2011	PW-102A 1 -11-28-2011	PW-102A 1 F - 11-28-2011	PW-102A-D 1 - 11-28-2011
			Sample Date		10/29/2008	11/28/2011	11/28/2011	11/28/2011	11/28/2011	11/28/2011
			Depth Interval		0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units						
RA PW VOCs	N	Trichlorofluoromethane	75-69-4	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	N	Vinyl Acetate	108-05-4	ug/l	5 U					
RA PW VOCs	N	Vinyl Chloride	75-01-4	ug/l	1 U	1 U		1 U		1 U
RA PW VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l						
RA PW VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l						
RA PW VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l						
RA PW VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l						
RA PW VOCs	T	1,1-Dichloroethane	75-34-3	ug/l						
RA PW VOCs	T	1,1-Dichloroethene	75-35-4	ug/l						
RA PW VOCs	T	1,1-Dichloropropene	563-58-6	ug/l						
RA PW VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l						
RA PW VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l						
RA PW VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l						
RA PW VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l						
RA PW VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l						
RA PW VOCs	T	1,2-Dibromoethane	106-93-4	ug/l						
RA PW VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l						
RA PW VOCs	T	1,2-Dichloroethane	107-06-2	ug/l						
RA PW VOCs	T	1,2-Dichloropropane	78-87-5	ug/l						
RA PW VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l						
RA PW VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l						
RA PW VOCs	T	1,3-Dichloropropane	142-28-9	ug/l						
RA PW VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l						
RA PW VOCs	T	2,2-Dichloropropane	594-20-7	ug/l						
RA PW VOCs	T	2-Butanone (MEK)	78-93-3	ug/l						
RA PW VOCs	T	2-Chlorotoluene	95-49-8	ug/l						
RA PW VOCs	T	2-Hexanone	591-78-6	ug/l						
RA PW VOCs	T	4-Chlorotoluene	106-43-4	ug/l						
RA PW VOCs	T	4-Isopropyltoluene	99-87-6	ug/l						
RA PW VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l						
RA PW VOCs	T	Acetone	67-64-1	ug/l						
RA PW VOCs	T	Benzene	71-43-2	ug/l						
RA PW VOCs	T	Bromobenzene	108-86-1	ug/l						
RA PW VOCs	T	Bromochloromethane	74-97-5	ug/l						
RA PW VOCs	T	Bromodichloromethane	75-27-4	ug/l						
RA PW VOCs	T	Bromoform	75-25-2	ug/l						
RA PW VOCs	T	Bromomethane	74-83-9	ug/l						
RA PW VOCs	T	Carbon Disulfide	75-15-0	ug/l						
RA PW VOCs	T	Carbon Tetrachloride	56-23-5	ug/l						
RA PW VOCs	T	Chlorobenzene	108-90-7	ug/l						
RA PW VOCs	T	Chloroethane	75-00-3	ug/l						
RA PW VOCs	T	Chloroform	67-66-3	ug/l						
RA PW VOCs	T	Chloromethane	74-87-3	ug/l						
RA PW VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l						
RA PW VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l						
RA PW VOCs	T	dibromochloromethane	124-48-1	ug/l						
RA PW VOCs	T	Dibromomethane	74-95-3	ug/l						
RA PW VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l						
RA PW VOCs	T	Diisopropyl Ether	108-20-3	ug/l						
RA PW VOCs	T	Ethylbenzene	100-41-4	ug/l						
RA PW VOCs	T	Freon 113	76-13-1	ug/l						
RA PW VOCs	T	Hexachlorobutadiene	87-68-3	ug/l						
RA PW VOCs	T	Hexane	110-54-3	ug/l						

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location Group		Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID		PW-1	PW-101	PW-101	PW-102	PW-102	PW-102
			Sample Type Code		N	N	N	N	N	FD
			Sample ID		PW-1-102908	PW-101A 1 - 11-28-2011	PW-101A 1 F - 11-28-2011	PW-102A 1 -11-28-2011	PW-102A 1 F - 11-28-2011	PW-102A-D 1 - 11-28-2011
			Sample Date		10/29/2008	11/28/2011	11/28/2011	11/28/2011	11/28/2011	11/28/2011
			Depth Interval		0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units						
RA PW VOCs	T	Isopropylbenzene	98-82-8	ug/l						
RA PW VOCs	T	M,P-Xylenes	179601-23-1	ug/l						
RA PW VOCs	T	Methylene Chloride	75-09-2	ug/l						
RA PW VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l						
RA PW VOCs	T	Naphthalene	91-20-3	ug/l						
RA PW VOCs	T	n-Butylbenzene	104-51-8	ug/l						
RA PW VOCs	T	n-Propylbenzene	103-65-1	ug/l						
RA PW VOCs	T	O-Xylene	95-47-6	ug/l						
RA PW VOCs	T	sec-Butylbenzene	135-98-8	ug/l						
RA PW VOCs	T	Styrene	100-42-5	ug/l						
RA PW VOCs	T	tert-Butylbenzene	98-06-6	ug/l						
RA PW VOCs	T	Tetrachloroethene	127-18-4	ug/l						
RA PW VOCs	T	Tetrahydrofuran	109-99-9	ug/l						
RA PW VOCs	T	Toluene	108-88-3	ug/l						
RA PW VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l						
RA PW VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l						
RA PW VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l						
RA PW VOCs	T	Trichloroethylene	79-01-6	ug/l						
RA PW VOCs	T	Trichlorofluoromethane	75-69-4	ug/l						
RA PW VOCs	T	Vinyl Chloride	75-01-4	ug/l						

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-103	PW-103	PW-104	PW-104	PW-104	PW-105
					Sample Type Code	N	N	N	N	FD	N
					Sample ID	PW-103A 1 - 11-28-2011	PW-103A 1 F - 11-28-2011	PW-104A 1 - 11-28-2011	PW-104A 1 F - 11-28-2011	PW-104A 1DUP - 11-28-2011	PW-105A 1 - 11-28-2011
					Sample Date	11/28/2011	11/28/2011	11/28/2011	11/28/2011	11/28/2011	11/28/2011
					Depth Interval	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units							
RA PW Metals	D	Arsenic	7440-38-2	ug/l		2.2 J		3.8			
RA PW Metals	D	Barium	7440-39-3	ug/l		8.3 J		10.6 J			
RA PW Metals	D	Cadmium	7440-43-9	ug/l		0.04 J		0.12 UJ			
RA PW Metals	D	Chromium	7440-47-3	ug/l		2.4 J		3.4 J			
RA PW Metals	D	Lead	7439-92-1	ug/l		12.5 U		12.5 U			
RA PW Metals	D	Mercury	7439-97-6	ug/l		0.2 U		0.2 U			
RA PW Metals	D	Selenium	7782-49-2	ug/l		5 UJ		4.4 J			
RA PW Metals	D	Silver	7440-22-4	ug/l		0.25 U		0.25 U			
RA PW Metals	T	Arsenic	7440-38-2	ug/l	3.3		3.3 J		4.6 J		0.4 J
RA PW Metals	T	Barium	7440-39-3	ug/l	8.4 J		11.1 J		10.5 J		9.3 J
RA PW Metals	T	Cadmium	7440-43-9	ug/l	0.12 U		0.03 J		0.12 UJ		0.12 U
RA PW Metals	T	Chromium	7440-47-3	ug/l	2.8 J		3.8 J		3.2 J		4.8 J
RA PW Metals	T	Lead	7439-92-1	ug/l	12.5 U		12.5 U		12.5 U		12.5 U
RA PW Metals	T	Mercury	7439-97-6	ug/l	0.2 U		0.2 U		0.2 U		0.2 U
RA PW Metals	T	Selenium	7782-49-2	ug/l	5 UJ		5.8 J		3.9 J		9.4 J
RA PW Metals	T	Silver	7440-22-4	ug/l	0.25 U		0.51 J		0.25 UJ		0.25 U
RA PW PCBs	D	Aroclor 1016	12674-11-2	ug/l		0.11 U		0.11 U			
RA PW PCBs	D	Aroclor 1221	11104-28-2	ug/l		0.11 U		0.11 U			
RA PW PCBs	D	Aroclor 1232	11141-16-5	ug/l		0.11 U		0.11 U			
RA PW PCBs	D	Aroclor 1242	53469-21-9	ug/l		0.11 U		0.11 U			
RA PW PCBs	D	Aroclor 1248	12672-29-6	ug/l		0.11 U		0.11 U			
RA PW PCBs	D	Aroclor 1254	11097-69-1	ug/l		0.11 U		0.11 U			
RA PW PCBs	D	Aroclor 1260	11096-82-5	ug/l		0.11 U		0.11 U			
RA PW PCBs	D	Aroclor 1262	37324-23-5	ug/l		0.11 U		0.11 U			
RA PW PCBs	D	Aroclor 1268	11100-14-4	ug/l		0.11 U		0.11 U			
RA PW PCBs	D	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l		0.99 U		0.99 U			
RA PW PCBs	N	Aroclor 1016	12674-11-2	ug/l	0.11 U		0.11 U				0.11 U
RA PW PCBs	N	Aroclor 1221	11104-28-2	ug/l	0.11 U		0.11 U				0.11 U
RA PW PCBs	N	Aroclor 1232	11141-16-5	ug/l	0.11 U		0.11 U				0.11 U
RA PW PCBs	N	Aroclor 1242	53469-21-9	ug/l	0.11 U		0.11 U				0.11 U
RA PW PCBs	N	Aroclor 1248	12672-29-6	ug/l	0.11 U		0.11 U				0.11 U
RA PW PCBs	N	Aroclor 1254	11097-69-1	ug/l	0.11 U		0.11 U				0.11 U
RA PW PCBs	N	Aroclor 1260	11096-82-5	ug/l	0.11 U		0.11 U				0.11 U
RA PW PCBs	N	Aroclor 1262	37324-23-5	ug/l	0.11 U		0.11 U				0.11 U
RA PW PCBs	N	Aroclor 1268	11100-14-4	ug/l	0.11 U		0.11 U				0.11 U
RA PW PCBs	N	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l	0.99 U		0.99 U				0.99 U
RA PW VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.5 U		0.5 U				0.5 U
RA PW VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,1-Dichloroethane	75-34-3	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,1-Dichloroethene	75-35-4	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,1-Dichloropropene	563-58-6	ug/l	2 U		2 U				2 U
RA PW VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	5 U		5 U				5 U
RA PW VOCs	N	1,2-Dibromoethane	106-93-4	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,2-Dichloroethane	107-06-2	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,2-Dichloropropane	78-87-5	ug/l	1 U		1 U				1 U
RA PW VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l	1 U		1 U				1 U

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-103	PW-103	PW-104	PW-104	PW-104	PW-105
					Sample Type Code	N	N	N	N	FD	N
					Sample ID	PW-103A 1 - 11-28-2011	PW-103A 1 F - 11-28-2011	PW-104A 1 - 11-28-2011	PW-104A 1 F - 11-28-2011	PW-104A 1DUP - 11-28-2011	PW-105A 1 - 11-28-2011
					Sample Date	11/28/2011	11/28/2011	11/28/2011	11/28/2011	11/28/2011	11/28/2011
					Depth Interval	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units							
RA PW VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l	1 U		1 U			1 U
RA PW VOCs	N	1,3-Dichloropropane	142-28-9	ug/l	1 U		1 U			1 U
RA PW VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l	1 U		1 U			1 U
RA PW VOCs	N	1-Chlorohexane	544-10-5	ug/l						
RA PW VOCs	N	2,2-Dichloropropane	594-20-7	ug/l	1 U		1 U			1 U
RA PW VOCs	N	2-Butanone (MEK)	78-93-3	ug/l	10 U		10 U			10 U
RA PW VOCs	N	2-Chlorotoluene	95-49-8	ug/l	1 U		1 U			1 U
RA PW VOCs	N	2-Hexanone	591-78-6	ug/l	10 U		10 U			10 U
RA PW VOCs	N	4-Chlorotoluene	106-43-4	ug/l	1 U		1 U			1 U
RA PW VOCs	N	4-Isopropyltoluene	99-87-6	ug/l	1 U		1 U			1 U
RA PW VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l	10 U		10 U			10 U
RA PW VOCs	N	Acetone	67-64-1	ug/l	10 U		10 U			10 U
RA PW VOCs	N	Benzene	71-43-2	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Bromobenzene	108-86-1	ug/l	2 U		2 U			2 U
RA PW VOCs	N	Bromochloromethane	74-97-5	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Bromodichloromethane	75-27-4	ug/l	0.6 U		0.6 U			0.6 U
RA PW VOCs	N	Bromoform	75-25-2	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Bromomethane	74-83-9	ug/l	2 U		2 U			2 U
RA PW VOCs	N	Carbon Disulfide	75-15-0	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Carbon Tetrachloride	56-23-5	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Chlorobenzene	108-90-7	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Chloroethane	75-00-3	ug/l	2 U		2 U			2 U
RA PW VOCs	N	Chloroform	67-66-3	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Chloromethane	74-87-3	ug/l	2 U		2 U			2 U
RA PW VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l	1 U		1 U			1 U
RA PW VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.4 U		0.4 U			0.4 U
RA PW VOCs	N	Cyclohexane	110-82-7	ug/l						
RA PW VOCs	N	dibromochloromethane	124-48-1	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Dibromomethane	74-95-3	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l	2 U		2 U			2 U
RA PW VOCs	N	Ethylbenzene	100-41-4	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Freon 113	76-13-1	ug/l						
RA PW VOCs	N	Hexachlorobutadiene	87-68-3	ug/l	0.6 U		0.6 U			0.6 U
RA PW VOCs	N	Isopropylbenzene	98-82-8	ug/l	1 U		1 UJ			1 U
RA PW VOCs	N	M,P-Xylenes	179601-23-1	ug/l	2 U		2 U			2 U
RA PW VOCs	N	Methyl Acetate	79-20-9	ug/l						
RA PW VOCs	N	Methylcyclohexane	108-87-2	ug/l						
RA PW VOCs	N	Methylene Chloride	75-09-2	ug/l	2 U		2 U			2 U
RA PW VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Naphthalene	91-20-3	ug/l	1 U		1 U			1 U
RA PW VOCs	N	n-Butylbenzene	104-51-8	ug/l	1 U		1 U			1 U
RA PW VOCs	N	n-Propylbenzene	103-65-1	ug/l	1 U		1 U			1 U
RA PW VOCs	N	O-Xylene	95-47-6	ug/l	1 U		1 U			1 U
RA PW VOCs	N	sec-Butylbenzene	135-98-8	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Styrene	100-42-5	ug/l	1 U		1 U			1 U
RA PW VOCs	N	tert-Butylbenzene	98-06-6	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Tetrachloroethene	127-18-4	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Tetrahydrofuran	109-99-9	ug/l						
RA PW VOCs	N	Toluene	108-88-3	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l	3.0 U		3.0 U			3.0 U
RA PW VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l	1 U		1 U			1 U
RA PW VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.4 U		0.4 U			0.4 U
RA PW VOCs	N	Trichloroethylene	79-01-6	ug/l	1 U		1 U			1 U

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location Group		Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID		PW-103	PW-103	PW-104	PW-104	PW-104	PW-105
			Sample Type Code		N	N	N	N	FD	N
			Sample ID		PW-103A 1 - 11-28-2011	PW-103A 1 F - 11-28-2011	PW-104A 1 - 11-28-2011	PW-104A 1 F - 11-28-2011	PW-104A 1DUP - 11-28-2011	PW-105A 1 - 11-28-2011
			Sample Date		11/28/2011	11/28/2011	11/28/2011	11/28/2011	11/28/2011	11/28/2011
			Depth Interval		0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units						
RA PW VOCs	N	Trichlorofluoromethane	75-69-4	ug/l	1 U		1 U			1 U
RA PW VOCs	N	Vinyl Acetate	108-05-4	ug/l						
RA PW VOCs	N	Vinyl Chloride	75-01-4	ug/l	1 U		1 U			1 U
RA PW VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l						
RA PW VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l						
RA PW VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l						
RA PW VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l						
RA PW VOCs	T	1,1-Dichloroethane	75-34-3	ug/l						
RA PW VOCs	T	1,1-Dichloroethene	75-35-4	ug/l						
RA PW VOCs	T	1,1-Dichloropropene	563-58-6	ug/l						
RA PW VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l						
RA PW VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l						
RA PW VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l						
RA PW VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l						
RA PW VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l						
RA PW VOCs	T	1,2-Dibromoethane	106-93-4	ug/l						
RA PW VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l						
RA PW VOCs	T	1,2-Dichloroethane	107-06-2	ug/l						
RA PW VOCs	T	1,2-Dichloropropane	78-87-5	ug/l						
RA PW VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l						
RA PW VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l						
RA PW VOCs	T	1,3-Dichloropropane	142-28-9	ug/l						
RA PW VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l						
RA PW VOCs	T	2,2-Dichloropropane	594-20-7	ug/l						
RA PW VOCs	T	2-Butanone (MEK)	78-93-3	ug/l						
RA PW VOCs	T	2-Chlorotoluene	95-49-8	ug/l						
RA PW VOCs	T	2-Hexanone	591-78-6	ug/l						
RA PW VOCs	T	4-Chlorotoluene	106-43-4	ug/l						
RA PW VOCs	T	4-Isopropyltoluene	99-87-6	ug/l						
RA PW VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l						
RA PW VOCs	T	Acetone	67-64-1	ug/l						
RA PW VOCs	T	Benzene	71-43-2	ug/l						
RA PW VOCs	T	Bromobenzene	108-86-1	ug/l						
RA PW VOCs	T	Bromochloromethane	74-97-5	ug/l						
RA PW VOCs	T	Bromodichloromethane	75-27-4	ug/l						
RA PW VOCs	T	Bromoform	75-25-2	ug/l						
RA PW VOCs	T	Bromomethane	74-83-9	ug/l						
RA PW VOCs	T	Carbon Disulfide	75-15-0	ug/l						
RA PW VOCs	T	Carbon Tetrachloride	56-23-5	ug/l						
RA PW VOCs	T	Chlorobenzene	108-90-7	ug/l						
RA PW VOCs	T	Chloroethane	75-00-3	ug/l						
RA PW VOCs	T	Chloroform	67-66-3	ug/l						
RA PW VOCs	T	Chloromethane	74-87-3	ug/l						
RA PW VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l						
RA PW VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l						
RA PW VOCs	T	dibromochloromethane	124-48-1	ug/l						
RA PW VOCs	T	Dibromomethane	74-95-3	ug/l						
RA PW VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l						
RA PW VOCs	T	Diisopropyl Ether	108-20-3	ug/l						
RA PW VOCs	T	Ethylbenzene	100-41-4	ug/l						
RA PW VOCs	T	Freon 113	76-13-1	ug/l						
RA PW VOCs	T	Hexachlorobutadiene	87-68-3	ug/l						
RA PW VOCs	T	Hexane	110-54-3	ug/l						

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	PW-103	PW-103	PW-104	PW-104	PW-104	PW-105
				Sample Type Code	N	N	N	N	FD	N
				Sample ID	PW-103A 1 - 11-28-2011	PW-103A 1 F - 11-28-2011	PW-104A 1 - 11-28-2011	PW-104A 1 F - 11-28-2011	PW-104A 1DUP - 11-28-2011	PW-105A 1 - 11-28-2011
				Sample Date	11/28/2011	11/28/2011	11/28/2011	11/28/2011	11/28/2011	11/28/2011
				Depth Interval	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft	0.75 - 1 ft
Method Analyte Group	Fraction	Compound	CAS #	Units						
RA PW VOCs	T	Isopropylbenzene	98-82-8	ug/l						
RA PW VOCs	T	M,P-Xylenes	179601-23-1	ug/l						
RA PW VOCs	T	Methylene Chloride	75-09-2	ug/l						
RA PW VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l						
RA PW VOCs	T	Naphthalene	91-20-3	ug/l						
RA PW VOCs	T	n-Butylbenzene	104-51-8	ug/l						
RA PW VOCs	T	n-Propylbenzene	103-65-1	ug/l						
RA PW VOCs	T	O-Xylene	95-47-6	ug/l						
RA PW VOCs	T	sec-Butylbenzene	135-98-8	ug/l						
RA PW VOCs	T	Styrene	100-42-5	ug/l						
RA PW VOCs	T	tert-Butylbenzene	98-06-6	ug/l						
RA PW VOCs	T	Tetrachloroethene	127-18-4	ug/l						
RA PW VOCs	T	Tetrahydrofuran	109-99-9	ug/l						
RA PW VOCs	T	Toluene	108-88-3	ug/l						
RA PW VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l						
RA PW VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l						
RA PW VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l						
RA PW VOCs	T	Trichloroethylene	79-01-6	ug/l						
RA PW VOCs	T	Trichlorofluoromethane	75-69-4	ug/l						
RA PW VOCs	T	Vinyl Chloride	75-01-4	ug/l						

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-105	PW-1-2014	PW-1-2014	PW-1-2014	PW-1-2014	PW-1-2014	PW-1-2014
					Sample Type Code	N	N	N	N	FD	FD	FD
					Sample ID	PW-105A 1 F - 11-28-2011	PW-1-A	PW-1-A-F	PW-1-AM	PW-199-A	PW-199-A-F	PW-1-ADUP
					Sample Date	11/28/2011	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014
					Depth Interval	0.75 - 1 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA PW Metals	D	Arsenic	7440-38-2	ug/l	4.5		1 U			1 U		
RA PW Metals	D	Barium	7440-39-3	ug/l	9.6 J		69.3			66.4		
RA PW Metals	D	Cadmium	7440-43-9	ug/l	0.24 J		0.1 UJ			0.1 UJ		
RA PW Metals	D	Chromium	7440-47-3	ug/l	4.5 J		3 U			3 U		
RA PW Metals	D	Lead	7439-92-1	ug/l	12.5 U		1 U			1 U		
RA PW Metals	D	Mercury	7439-97-6	ug/l	0.2 U		0.2 UJ			0.2 UJ		
RA PW Metals	D	Selenium	7782-49-2	ug/l	14.2 J		2 U			2 U		
RA PW Metals	D	Silver	7440-22-4	ug/l	0.25 U		0.1 UJ			0.1 UJ		
RA PW Metals	T	Arsenic	7440-38-2	ug/l		1 U			1 U			1 U
RA PW Metals	T	Barium	7440-39-3	ug/l		67.2			68.3			65.6
RA PW Metals	T	Cadmium	7440-43-9	ug/l		0.04 J			0.1 UJ			0.1 UJ
RA PW Metals	T	Chromium	7440-47-3	ug/l		3 U			3 U			3 U
RA PW Metals	T	Lead	7439-92-1	ug/l		1 U			1 U			1 U
RA PW Metals	T	Mercury	7439-97-6	ug/l		0.2 UJ			0.2 UJ			0.2 U
RA PW Metals	T	Selenium	7782-49-2	ug/l		2 U			2 U			2 U
RA PW Metals	T	Silver	7440-22-4	ug/l		0.1 UJ			0.1 UJ			0.1 U
RA PW PCBs	D	Aroclor 1016	12674-11-2	ug/l	0.11 U							
RA PW PCBs	D	Aroclor 1221	11104-28-2	ug/l	0.11 U							
RA PW PCBs	D	Aroclor 1232	11141-16-5	ug/l	0.11 U							
RA PW PCBs	D	Aroclor 1242	53469-21-9	ug/l	0.11 U							
RA PW PCBs	D	Aroclor 1248	12672-29-6	ug/l	0.11 U							
RA PW PCBs	D	Aroclor 1254	11097-69-1	ug/l	0.11 U							
RA PW PCBs	D	Aroclor 1260	11096-82-5	ug/l	0.11 U							
RA PW PCBs	D	Aroclor 1262	37324-23-5	ug/l	0.11 U							
RA PW PCBs	D	Aroclor 1268	11100-14-4	ug/l	0.11 U							
RA PW PCBs	D	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l	0.99 U							
RA PW PCBs	N	Aroclor 1016	12674-11-2	ug/l								
RA PW PCBs	N	Aroclor 1221	11104-28-2	ug/l								
RA PW PCBs	N	Aroclor 1232	11141-16-5	ug/l								
RA PW PCBs	N	Aroclor 1242	53469-21-9	ug/l								
RA PW PCBs	N	Aroclor 1248	12672-29-6	ug/l								
RA PW PCBs	N	Aroclor 1254	11097-69-1	ug/l								
RA PW PCBs	N	Aroclor 1260	11096-82-5	ug/l								
RA PW PCBs	N	Aroclor 1262	37324-23-5	ug/l								
RA PW PCBs	N	Aroclor 1268	11100-14-4	ug/l								
RA PW PCBs	N	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l								
RA PW VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l								
RA PW VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l								
RA PW VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l								
RA PW VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l								
RA PW VOCs	N	1,1-Dichloroethane	75-34-3	ug/l								
RA PW VOCs	N	1,1-Dichloroethene	75-35-4	ug/l								
RA PW VOCs	N	1,1-Dichloropropene	563-58-6	ug/l								
RA PW VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l								
RA PW VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l								
RA PW VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l								
RA PW VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l								
RA PW VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l								
RA PW VOCs	N	1,2-Dibromoethane	106-93-4	ug/l								
RA PW VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l								
RA PW VOCs	N	1,2-Dichloroethane	107-06-2	ug/l								
RA PW VOCs	N	1,2-Dichloropropane	78-87-5	ug/l								
RA PW VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l								

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-105	PW-1-2014	PW-1-2014	PW-1-2014	PW-1-2014	PW-1-2014	PW-1-2014
					Sample Type Code	N	N	N	N	FD	FD	FD
					Sample ID	PW-105A 1 F - 11-28-2011	PW-1-A	PW-1-A-F	PW-1-AM	PW-199-A	PW-199-A-F	PW-1-ADUP
					Sample Date	11/28/2011	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014
					Depth Interval	0.75 - 1 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA PW VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l								
RA PW VOCs	N	1,3-Dichloropropane	142-28-9	ug/l								
RA PW VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l								
RA PW VOCs	N	1-Chlorohexane	544-10-5	ug/l								
RA PW VOCs	N	2,2-Dichloropropane	594-20-7	ug/l								
RA PW VOCs	N	2-Butanone (MEK)	78-93-3	ug/l								
RA PW VOCs	N	2-Chlorotoluene	95-49-8	ug/l								
RA PW VOCs	N	2-Hexanone	591-78-6	ug/l								
RA PW VOCs	N	4-Chlorotoluene	106-43-4	ug/l								
RA PW VOCs	N	4-Isopropyltoluene	99-87-6	ug/l								
RA PW VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l								
RA PW VOCs	N	Acetone	67-64-1	ug/l								
RA PW VOCs	N	Benzene	71-43-2	ug/l								
RA PW VOCs	N	Bromobenzene	108-86-1	ug/l								
RA PW VOCs	N	Bromochloromethane	74-97-5	ug/l								
RA PW VOCs	N	Bromodichloromethane	75-27-4	ug/l								
RA PW VOCs	N	Bromoform	75-25-2	ug/l								
RA PW VOCs	N	Bromomethane	74-83-9	ug/l								
RA PW VOCs	N	Carbon Disulfide	75-15-0	ug/l								
RA PW VOCs	N	Carbon Tetrachloride	56-23-5	ug/l								
RA PW VOCs	N	Chlorobenzene	108-90-7	ug/l								
RA PW VOCs	N	Chloroethane	75-00-3	ug/l								
RA PW VOCs	N	Chloroform	67-66-3	ug/l								
RA PW VOCs	N	Chloromethane	74-87-3	ug/l								
RA PW VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l								
RA PW VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l								
RA PW VOCs	N	Cyclohexane	110-82-7	ug/l								
RA PW VOCs	N	dibromochloromethane	124-48-1	ug/l								
RA PW VOCs	N	Dibromomethane	74-95-3	ug/l								
RA PW VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l								
RA PW VOCs	N	Ethylbenzene	100-41-4	ug/l								
RA PW VOCs	N	Freon 113	76-13-1	ug/l								
RA PW VOCs	N	Hexachlorobutadiene	87-68-3	ug/l								
RA PW VOCs	N	Isopropylbenzene	98-82-8	ug/l								
RA PW VOCs	N	M,P-Xylenes	179601-23-1	ug/l								
RA PW VOCs	N	Methyl Acetate	79-20-9	ug/l								
RA PW VOCs	N	Methylcyclohexane	108-87-2	ug/l								
RA PW VOCs	N	Methylene Chloride	75-09-2	ug/l								
RA PW VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l								
RA PW VOCs	N	Naphthalene	91-20-3	ug/l								
RA PW VOCs	N	n-Butylbenzene	104-51-8	ug/l								
RA PW VOCs	N	n-Propylbenzene	103-65-1	ug/l								
RA PW VOCs	N	O-Xylene	95-47-6	ug/l								
RA PW VOCs	N	sec-Butylbenzene	135-98-8	ug/l								
RA PW VOCs	N	Styrene	100-42-5	ug/l								
RA PW VOCs	N	tert-Butylbenzene	98-06-6	ug/l								
RA PW VOCs	N	Tetrachloroethene	127-18-4	ug/l								
RA PW VOCs	N	Tetrahydrofuran	109-99-9	ug/l								
RA PW VOCs	N	Toluene	108-88-3	ug/l								
RA PW VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l								
RA PW VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l								
RA PW VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l								
RA PW VOCs	N	Trichloroethylene	79-01-6	ug/l								

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-105	PW-1-2014	PW-1-2014	PW-1-2014	PW-1-2014	PW-1-2014	PW-1-2014
					Sample Type Code	N	N	N	N	FD	FD	FD
					Sample ID	PW-105A 1 F - 11-28-2011	PW-1-A	PW-1-A-F	PW-1-AM	PW-199-A	PW-199-A-F	PW-1-ADUP
					Sample Date	11/28/2011	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014
					Depth Interval	0.75 - 1 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA PW VOCs	N	Trichlorofluoromethane	75-69-4	ug/l								
RA PW VOCs	N	Vinyl Acetate	108-05-4	ug/l								
RA PW VOCs	N	Vinyl Chloride	75-01-4	ug/l								
RA PW VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l		0.5 UJ		0.25 U	0.5 UJ			
RA PW VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	1,1-Dichloroethane	75-34-3	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	1,1-Dichloroethene	75-35-4	ug/l		0.4 J		0.25 U	0.5 U			
RA PW VOCs	T	1,1-Dichloropropene	563-58-6	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l		0.5 UJ		0.25 U	0.5 UJ			
RA PW VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l		2 U		0.25 U	2 U			
RA PW VOCs	T	1,2-Dibromoethane	106-93-4	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	1,2-Dichloroethane	107-06-2	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	1,2-Dichloropropane	78-87-5	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	1,3-Dichloropropane	142-28-9	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	2,2-Dichloropropane	594-20-7	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	2-Butanone (MEK)	78-93-3	ug/l		5 U		5 U	5 U			
RA PW VOCs	T	2-Chlorotoluene	95-49-8	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	2-Hexanone	591-78-6	ug/l		5 U		2.5 U	5 U			
RA PW VOCs	T	4-Chlorotoluene	106-43-4	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	4-Isopropyltoluene	99-87-6	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l		5 U		2.5 U	5 U			
RA PW VOCs	T	Acetone	67-64-1	ug/l		5 U		5 U	5 U			
RA PW VOCs	T	Benzene	71-43-2	ug/l		0.2 J		0.25 J	0.2 J			
RA PW VOCs	T	Bromobenzene	108-86-1	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	Bromochloromethane	74-97-5	ug/l		0.5 U		0.5 U	0.5 U			
RA PW VOCs	T	Bromodichloromethane	75-27-4	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	Bromoform	75-25-2	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	Bromomethane	74-83-9	ug/l		1 UJ		0.59 UJ	1 UJ			
RA PW VOCs	T	Carbon Disulfide	75-15-0	ug/l		0.6 J		0.25 U	0.5 J			
RA PW VOCs	T	Carbon Tetrachloride	56-23-5	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	Chlorobenzene	108-90-7	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	Chloroethane	75-00-3	ug/l		1 U		0.25 U	1 U			
RA PW VOCs	T	Chloroform	67-66-3	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	Chloromethane	74-87-3	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l		35.2 J		36	34.5 J			
RA PW VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l		0.2 U		0.25 UJ	0.2 U			
RA PW VOCs	T	dibromochloromethane	124-48-1	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	Dibromomethane	74-95-3	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l		1 U		0.25 U	1 U			
RA PW VOCs	T	Diisopropyl Ether	108-20-3	ug/l				0.25 U				
RA PW VOCs	T	Ethylbenzene	100-41-4	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	Freon 113	76-13-1	ug/l				0.25 U				
RA PW VOCs	T	Hexachlorobutadiene	87-68-3	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	Hexane	110-54-3	ug/l				0.25 U				

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-105	PW-1-2014	PW-1-2014	PW-1-2014	PW-1-2014	PW-1-2014	PW-1-2014
					Sample Type Code	N	N	N	N	FD	FD	FD
					Sample ID	PW-105A 1 F - 11-28-2011	PW-1-A	PW-1-A-F	PW-1-AM	PW-199-A	PW-199-A-F	PW-1-ADUP
					Sample Date	11/28/2011	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014
					Depth Interval	0.75 - 1 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA PW VOCs	T	Isopropylbenzene	98-82-8	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	M,P-Xylenes	179601-23-1	ug/l		0.4 U		0.5 U	0.4 U			
RA PW VOCs	T	Methylene Chloride	75-09-2	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	Naphthalene	91-20-3	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	n-Butylbenzene	104-51-8	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	n-Propylbenzene	103-65-1	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	O-Xylene	95-47-6	ug/l		0.1 J		0.08 J	0.1 J			
RA PW VOCs	T	sec-Butylbenzene	135-98-8	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	Styrene	100-42-5	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	tert-Butylbenzene	98-06-6	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	Tetrachloroethene	127-18-4	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	Tetrahydrofuran	109-99-9	ug/l				2.5 U				
RA PW VOCs	T	Toluene	108-88-3	ug/l		0.2 U		0.25 U	0.2 U			
RA PW VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l		0.50		0.58	0.50			
RA PW VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l		1.3		1.4	1.2			
RA PW VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l		0.2 U		0.25 UJ	0.2 U			
RA PW VOCs	T	Trichloroethylene	79-01-6	ug/l		2		2.3	2			
RA PW VOCs	T	Trichlorofluoromethane	75-69-4	ug/l		0.5 U		0.25 U	0.5 U			
RA PW VOCs	T	Vinyl Chloride	75-01-4	ug/l		7.7		8.9	7.1			

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-1-2014	PW-2-2014	PW-2-2014	PW-2-2014	PW-3-2014	PW-3-2014	PW-3-2014
					Sample Type Code	FD	N	N	N	N	N	N
					Sample ID	PW-1-A-FDUP	PW-2-A	PW-2-A-F	PW-2-AM	PW-3-A	PW-3-A-F	PW-3-AM
					Sample Date	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014
					Depth Interval	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA PW Metals	D	Arsenic	7440-38-2	ug/l	1 U		12.6			3.7		
RA PW Metals	D	Barium	7440-39-3	ug/l	68		13.6 J			19 J		
RA PW Metals	D	Cadmium	7440-43-9	ug/l	0.1 U		0.09 J			0.08 J		
RA PW Metals	D	Chromium	7440-47-3	ug/l	3 U		2.4 J			2.1 J		
RA PW Metals	D	Lead	7439-92-1	ug/l	1 U		2 U			19.6		
RA PW Metals	D	Mercury	7439-97-6	ug/l	0.2 U		0.2 UJ			0.2 UJ		
RA PW Metals	D	Selenium	7782-49-2	ug/l	2 U		2 U			2 U		
RA PW Metals	D	Silver	7440-22-4	ug/l	0.1 U		0.3 UJ			0.3 UJ		
RA PW Metals	T	Arsenic	7440-38-2	ug/l		14.9			3.5			
RA PW Metals	T	Barium	7440-39-3	ug/l		13.4 J			18.4 J			
RA PW Metals	T	Cadmium	7440-43-9	ug/l		0.1 UJ			0.3 UJ			
RA PW Metals	T	Chromium	7440-47-3	ug/l		2.2 J			2.1 J			
RA PW Metals	T	Lead	7439-92-1	ug/l		0.8 J			2 U			
RA PW Metals	T	Mercury	7439-97-6	ug/l		0.2 UJ			0.2 UJ			
RA PW Metals	T	Selenium	7782-49-2	ug/l		2 U			2 U			
RA PW Metals	T	Silver	7440-22-4	ug/l		0.1 UJ			0.3 UJ			
RA PW PCBs	D	Aroclor 1016	12674-11-2	ug/l								
RA PW PCBs	D	Aroclor 1221	11104-28-2	ug/l								
RA PW PCBs	D	Aroclor 1232	11141-16-5	ug/l								
RA PW PCBs	D	Aroclor 1242	53469-21-9	ug/l								
RA PW PCBs	D	Aroclor 1248	12672-29-6	ug/l								
RA PW PCBs	D	Aroclor 1254	11097-69-1	ug/l								
RA PW PCBs	D	Aroclor 1260	11096-82-5	ug/l								
RA PW PCBs	D	Aroclor 1262	37324-23-5	ug/l								
RA PW PCBs	D	Aroclor 1268	11100-14-4	ug/l								
RA PW PCBs	D	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l								
RA PW PCBs	N	Aroclor 1016	12674-11-2	ug/l								
RA PW PCBs	N	Aroclor 1221	11104-28-2	ug/l								
RA PW PCBs	N	Aroclor 1232	11141-16-5	ug/l								
RA PW PCBs	N	Aroclor 1242	53469-21-9	ug/l								
RA PW PCBs	N	Aroclor 1248	12672-29-6	ug/l								
RA PW PCBs	N	Aroclor 1254	11097-69-1	ug/l								
RA PW PCBs	N	Aroclor 1260	11096-82-5	ug/l								
RA PW PCBs	N	Aroclor 1262	37324-23-5	ug/l								
RA PW PCBs	N	Aroclor 1268	11100-14-4	ug/l								
RA PW PCBs	N	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l								
RA PW VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l								
RA PW VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l								
RA PW VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l								
RA PW VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l								
RA PW VOCs	N	1,1-Dichloroethane	75-34-3	ug/l								
RA PW VOCs	N	1,1-Dichloroethene	75-35-4	ug/l								
RA PW VOCs	N	1,1-Dichloropropene	563-58-6	ug/l								
RA PW VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l								
RA PW VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l								
RA PW VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l								
RA PW VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l								
RA PW VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l								
RA PW VOCs	N	1,2-Dibromoethane	106-93-4	ug/l								
RA PW VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l								
RA PW VOCs	N	1,2-Dichloroethane	107-06-2	ug/l								
RA PW VOCs	N	1,2-Dichloropropane	78-87-5	ug/l								
RA PW VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l								

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-1-2014	PW-2-2014	PW-2-2014	PW-2-2014	PW-3-2014	PW-3-2014	PW-3-2014
					Sample Type Code	FD	N	N	N	N	N	N
					Sample ID	PW-1-A-FDUP	PW-2-A	PW-2-A-F	PW-2-AM	PW-3-A	PW-3-A-F	PW-3-AM
					Sample Date	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014
					Depth Interval	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA PW VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l								
RA PW VOCs	N	1,3-Dichloropropane	142-28-9	ug/l								
RA PW VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l								
RA PW VOCs	N	1-Chlorohexane	544-10-5	ug/l								
RA PW VOCs	N	2,2-Dichloropropane	594-20-7	ug/l								
RA PW VOCs	N	2-Butanone (MEK)	78-93-3	ug/l								
RA PW VOCs	N	2-Chlorotoluene	95-49-8	ug/l								
RA PW VOCs	N	2-Hexanone	591-78-6	ug/l								
RA PW VOCs	N	4-Chlorotoluene	106-43-4	ug/l								
RA PW VOCs	N	4-Isopropyltoluene	99-87-6	ug/l								
RA PW VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l								
RA PW VOCs	N	Acetone	67-64-1	ug/l								
RA PW VOCs	N	Benzene	71-43-2	ug/l								
RA PW VOCs	N	Bromobenzene	108-86-1	ug/l								
RA PW VOCs	N	Bromochloromethane	74-97-5	ug/l								
RA PW VOCs	N	Bromodichloromethane	75-27-4	ug/l								
RA PW VOCs	N	Bromoform	75-25-2	ug/l								
RA PW VOCs	N	Bromomethane	74-83-9	ug/l								
RA PW VOCs	N	Carbon Disulfide	75-15-0	ug/l								
RA PW VOCs	N	Carbon Tetrachloride	56-23-5	ug/l								
RA PW VOCs	N	Chlorobenzene	108-90-7	ug/l								
RA PW VOCs	N	Chloroethane	75-00-3	ug/l								
RA PW VOCs	N	Chloroform	67-66-3	ug/l								
RA PW VOCs	N	Chloromethane	74-87-3	ug/l								
RA PW VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l								
RA PW VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l								
RA PW VOCs	N	Cyclohexane	110-82-7	ug/l								
RA PW VOCs	N	dibromochloromethane	124-48-1	ug/l								
RA PW VOCs	N	Dibromomethane	74-95-3	ug/l								
RA PW VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l								
RA PW VOCs	N	Ethylbenzene	100-41-4	ug/l								
RA PW VOCs	N	Freon 113	76-13-1	ug/l								
RA PW VOCs	N	Hexachlorobutadiene	87-68-3	ug/l								
RA PW VOCs	N	Isopropylbenzene	98-82-8	ug/l								
RA PW VOCs	N	M,P-Xylenes	179601-23-1	ug/l								
RA PW VOCs	N	Methyl Acetate	79-20-9	ug/l								
RA PW VOCs	N	Methylcyclohexane	108-87-2	ug/l								
RA PW VOCs	N	Methylene Chloride	75-09-2	ug/l								
RA PW VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l								
RA PW VOCs	N	Naphthalene	91-20-3	ug/l								
RA PW VOCs	N	n-Butylbenzene	104-51-8	ug/l								
RA PW VOCs	N	n-Propylbenzene	103-65-1	ug/l								
RA PW VOCs	N	O-Xylene	95-47-6	ug/l								
RA PW VOCs	N	sec-Butylbenzene	135-98-8	ug/l								
RA PW VOCs	N	Styrene	100-42-5	ug/l								
RA PW VOCs	N	tert-Butylbenzene	98-06-6	ug/l								
RA PW VOCs	N	Tetrachloroethene	127-18-4	ug/l								
RA PW VOCs	N	Tetrahydrofuran	109-99-9	ug/l								
RA PW VOCs	N	Toluene	108-88-3	ug/l								
RA PW VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l								
RA PW VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l								
RA PW VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l								
RA PW VOCs	N	Trichloroethylene	79-01-6	ug/l								

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-1-2014	PW-2-2014	PW-2-2014	PW-2-2014	PW-3-2014	PW-3-2014	PW-3-2014
					Sample Type Code	FD	N	N	N	N	N	N
					Sample ID	PW-1-A-FDUP	PW-2-A	PW-2-A-F	PW-2-AM	PW-3-A	PW-3-A-F	PW-3-AM
					Sample Date	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014
					Depth Interval	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA PW VOCs	N	Trichlorofluoromethane	75-69-4	ug/l								
RA PW VOCs	N	Vinyl Acetate	108-05-4	ug/l								
RA PW VOCs	N	Vinyl Chloride	75-01-4	ug/l								
RA PW VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l		0.5 UJ		0.25 U	0.5 UJ		0.25 U
RA PW VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	1,1-Dichloroethane	75-34-3	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	1,1-Dichloroethene	75-35-4	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	1,1-Dichloropropene	563-58-6	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l		0.5 UJ		0.25 U	0.5 UJ		0.25 U
RA PW VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l		2 U		0.25 U	2 U		0.25 U
RA PW VOCs	T	1,2-Dibromoethane	106-93-4	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	1,2-Dichloroethane	107-06-2	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	1,2-Dichloropropane	78-87-5	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	1,3-Dichloropropane	142-28-9	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	2,2-Dichloropropane	594-20-7	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	2-Butanone (MEK)	78-93-3	ug/l		5 U		5 U	5 U		5 U
RA PW VOCs	T	2-Chlorotoluene	95-49-8	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	2-Hexanone	591-78-6	ug/l		5 U		2.5 U	5 U		2.5 U
RA PW VOCs	T	4-Chlorotoluene	106-43-4	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	4-Isopropyltoluene	99-87-6	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l		5 U		2.5 U	5 U		2.5 U
RA PW VOCs	T	Acetone	67-64-1	ug/l		5 U		5 U	5 U		5 U
RA PW VOCs	T	Benzene	71-43-2	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	Bromobenzene	108-86-1	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	Bromochloromethane	74-97-5	ug/l		0.5 U		0.5 U	0.5 U		0.5 U
RA PW VOCs	T	Bromodichloromethane	75-27-4	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	Bromoform	75-25-2	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	Bromomethane	74-83-9	ug/l		1 UJ		0.59 UJ	1 UJ		0.59 UJ
RA PW VOCs	T	Carbon Disulfide	75-15-0	ug/l		1.1		0.25 U	0.6 J		0.25 U
RA PW VOCs	T	Carbon Tetrachloride	56-23-5	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	Chlorobenzene	108-90-7	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	Chloroethane	75-00-3	ug/l		1 U		0.25 U	1 U		0.25 U
RA PW VOCs	T	Chloroform	67-66-3	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	Chloromethane	74-87-3	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l		0.5 UJ		0.25 U	0.5 UJ		0.25 U
RA PW VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l		0.2 U		0.25 UJ	0.2 U		0.25 UJ
RA PW VOCs	T	dibromochloromethane	124-48-1	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	Dibromomethane	74-95-3	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l		1 U		0.25 U	1 U		0.25 U
RA PW VOCs	T	Diisopropyl Ether	108-20-3	ug/l				0.25 U			0.25 U
RA PW VOCs	T	Ethylbenzene	100-41-4	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	Freon 113	76-13-1	ug/l				0.25 U			0.25 U
RA PW VOCs	T	Hexachlorobutadiene	87-68-3	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	Hexane	110-54-3	ug/l				0.25 U			0.25 U

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-1-2014	PW-2-2014	PW-2-2014	PW-2-2014	PW-3-2014	PW-3-2014	PW-3-2014
					Sample Type Code	FD	N	N	N	N	N	N
					Sample ID	PW-1-A-FDUP	PW-2-A	PW-2-A-F	PW-2-AM	PW-3-A	PW-3-A-F	PW-3-AM
					Sample Date	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014
					Depth Interval	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA PW VOCs	T	Isopropylbenzene	98-82-8	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	M,P-Xylenes	179601-23-1	ug/l		0.4 U		0.5 U	0.4 U		0.5 U
RA PW VOCs	T	Methylene Chloride	75-09-2	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	Naphthalene	91-20-3	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	n-Butylbenzene	104-51-8	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	n-Propylbenzene	103-65-1	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	O-Xylene	95-47-6	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	sec-Butylbenzene	135-98-8	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	Styrene	100-42-5	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	tert-Butylbenzene	98-06-6	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	Tetrachloroethene	127-18-4	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	Tetrahydrofuran	109-99-9	ug/l				2.5 U			2.5 U
RA PW VOCs	T	Toluene	108-88-3	ug/l		0.2 U		0.25 U	0.2 U		0.25 U
RA PW VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l		0.60 U		0.75 U	0.60 U		0.75 U
RA PW VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l		0.2 U		0.25 UJ	0.2 U		0.25 UJ
RA PW VOCs	T	Trichloroethylene	79-01-6	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	Trichlorofluoromethane	75-69-4	ug/l		0.5 U		0.25 U	0.5 U		0.25 U
RA PW VOCs	T	Vinyl Chloride	75-01-4	ug/l		0.5 U		0.25 U	0.5 U		0.25 U

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location Group					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location ID					PW-4-2014	PW-4-2014	PW-4-2014	PW-5-2014	PW-5-2014	PW-5-2014	PW-C
Sample Type Code					N	N	N	N	N	N	N
Sample ID					PW-4-A	PW-4-A-F	PW-4-AM	PW-5-A	PW-5-A-F	PW-5-AM	PW-C-AM
Sample Date					7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	8/4/2014
Depth Interval					2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units							
RA PW Metals	D	Arsenic	7440-38-2	ug/l		6.1 J			3 U		
RA PW Metals	D	Barium	7440-39-3	ug/l		17.6 J			18.2 J		
RA PW Metals	D	Cadmium	7440-43-9	ug/l		0.3 UJ			0.3 UJ		
RA PW Metals	D	Chromium	7440-47-3	ug/l		2.2 J			2.3 J		
RA PW Metals	D	Lead	7439-92-1	ug/l		2 U			2 U		
RA PW Metals	D	Mercury	7439-97-6	ug/l		0.2 UJ			0.2 UJ		
RA PW Metals	D	Selenium	7782-49-2	ug/l		2.7 J			2 U		
RA PW Metals	D	Silver	7440-22-4	ug/l		0.3 UJ			0.5 UJ		
RA PW Metals	T	Arsenic	7440-38-2	ug/l	6.8			1 U			
RA PW Metals	T	Barium	7440-39-3	ug/l	18 J			18.4 J			
RA PW Metals	T	Cadmium	7440-43-9	ug/l	0.1 UJ			0.1 UJ			
RA PW Metals	T	Chromium	7440-47-3	ug/l	1.6 J			2.3 J			
RA PW Metals	T	Lead	7439-92-1	ug/l	1 U			2 U			
RA PW Metals	T	Mercury	7439-97-6	ug/l	0.2 UJ			0.2 UJ			
RA PW Metals	T	Selenium	7782-49-2	ug/l	2 U			4 U			
RA PW Metals	T	Silver	7440-22-4	ug/l	0.3 UJ			0.3 UJ			
RA PW PCBs	D	Aroclor 1016	12674-11-2	ug/l							
RA PW PCBs	D	Aroclor 1221	11104-28-2	ug/l							
RA PW PCBs	D	Aroclor 1232	11141-16-5	ug/l							
RA PW PCBs	D	Aroclor 1242	53469-21-9	ug/l							
RA PW PCBs	D	Aroclor 1248	12672-29-6	ug/l							
RA PW PCBs	D	Aroclor 1254	11097-69-1	ug/l							
RA PW PCBs	D	Aroclor 1260	11096-82-5	ug/l							
RA PW PCBs	D	Aroclor 1262	37324-23-5	ug/l							
RA PW PCBs	D	Aroclor 1268	11100-14-4	ug/l							
RA PW PCBs	D	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l							
RA PW PCBs	N	Aroclor 1016	12674-11-2	ug/l							
RA PW PCBs	N	Aroclor 1221	11104-28-2	ug/l							
RA PW PCBs	N	Aroclor 1232	11141-16-5	ug/l							
RA PW PCBs	N	Aroclor 1242	53469-21-9	ug/l							
RA PW PCBs	N	Aroclor 1248	12672-29-6	ug/l							
RA PW PCBs	N	Aroclor 1254	11097-69-1	ug/l							
RA PW PCBs	N	Aroclor 1260	11096-82-5	ug/l							
RA PW PCBs	N	Aroclor 1262	37324-23-5	ug/l							
RA PW PCBs	N	Aroclor 1268	11100-14-4	ug/l							
RA PW PCBs	N	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l							
RA PW VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l							
RA PW VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l							
RA PW VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l							
RA PW VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l							
RA PW VOCs	N	1,1-Dichloroethane	75-34-3	ug/l							
RA PW VOCs	N	1,1-Dichloroethene	75-35-4	ug/l							
RA PW VOCs	N	1,1-Dichloropropene	563-58-6	ug/l							
RA PW VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l							
RA PW VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l							
RA PW VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l							
RA PW VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l							
RA PW VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l							
RA PW VOCs	N	1,2-Dibromoethane	106-93-4	ug/l							
RA PW VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l							
RA PW VOCs	N	1,2-Dichloroethane	107-06-2	ug/l							
RA PW VOCs	N	1,2-Dichloropropane	78-87-5	ug/l							
RA PW VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l							

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-4-2014	PW-4-2014	PW-4-2014	PW-5-2014	PW-5-2014	PW-5-2014	PW-C
					Sample Type Code	N	N	N	N	N	N	N
					Sample ID	PW-4-A	PW-4-A-F	PW-4-AM	PW-5-A	PW-5-A-F	PW-5-AM	PW-C-AM
					Sample Date	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	8/4/2014
					Depth Interval	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA PW VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l								
RA PW VOCs	N	1,3-Dichloropropane	142-28-9	ug/l								
RA PW VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l								
RA PW VOCs	N	1-Chlorohexane	544-10-5	ug/l								
RA PW VOCs	N	2,2-Dichloropropane	594-20-7	ug/l								
RA PW VOCs	N	2-Butanone (MEK)	78-93-3	ug/l								
RA PW VOCs	N	2-Chlorotoluene	95-49-8	ug/l								
RA PW VOCs	N	2-Hexanone	591-78-6	ug/l								
RA PW VOCs	N	4-Chlorotoluene	106-43-4	ug/l								
RA PW VOCs	N	4-Isopropyltoluene	99-87-6	ug/l								
RA PW VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l								
RA PW VOCs	N	Acetone	67-64-1	ug/l								
RA PW VOCs	N	Benzene	71-43-2	ug/l								
RA PW VOCs	N	Bromobenzene	108-86-1	ug/l								
RA PW VOCs	N	Bromochloromethane	74-97-5	ug/l								
RA PW VOCs	N	Bromodichloromethane	75-27-4	ug/l								
RA PW VOCs	N	Bromoform	75-25-2	ug/l								
RA PW VOCs	N	Bromomethane	74-83-9	ug/l								
RA PW VOCs	N	Carbon Disulfide	75-15-0	ug/l								
RA PW VOCs	N	Carbon Tetrachloride	56-23-5	ug/l								
RA PW VOCs	N	Chlorobenzene	108-90-7	ug/l								
RA PW VOCs	N	Chloroethane	75-00-3	ug/l								
RA PW VOCs	N	Chloroform	67-66-3	ug/l								
RA PW VOCs	N	Chloromethane	74-87-3	ug/l								
RA PW VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l								
RA PW VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l								
RA PW VOCs	N	Cyclohexane	110-82-7	ug/l								
RA PW VOCs	N	dibromochloromethane	124-48-1	ug/l								
RA PW VOCs	N	Dibromomethane	74-95-3	ug/l								
RA PW VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l								
RA PW VOCs	N	Ethylbenzene	100-41-4	ug/l								
RA PW VOCs	N	Freon 113	76-13-1	ug/l								
RA PW VOCs	N	Hexachlorobutadiene	87-68-3	ug/l								
RA PW VOCs	N	Isopropylbenzene	98-82-8	ug/l								
RA PW VOCs	N	M,P-Xylenes	179601-23-1	ug/l								
RA PW VOCs	N	Methyl Acetate	79-20-9	ug/l								
RA PW VOCs	N	Methylcyclohexane	108-87-2	ug/l								
RA PW VOCs	N	Methylene Chloride	75-09-2	ug/l								
RA PW VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l								
RA PW VOCs	N	Naphthalene	91-20-3	ug/l								
RA PW VOCs	N	n-Butylbenzene	104-51-8	ug/l								
RA PW VOCs	N	n-Propylbenzene	103-65-1	ug/l								
RA PW VOCs	N	O-Xylene	95-47-6	ug/l								
RA PW VOCs	N	sec-Butylbenzene	135-98-8	ug/l								
RA PW VOCs	N	Styrene	100-42-5	ug/l								
RA PW VOCs	N	tert-Butylbenzene	98-06-6	ug/l								
RA PW VOCs	N	Tetrachloroethene	127-18-4	ug/l								
RA PW VOCs	N	Tetrahydrofuran	109-99-9	ug/l								
RA PW VOCs	N	Toluene	108-88-3	ug/l								
RA PW VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l								
RA PW VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l								
RA PW VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l								
RA PW VOCs	N	Trichloroethylene	79-01-6	ug/l								

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-4-2014	PW-4-2014	PW-4-2014	PW-5-2014	PW-5-2014	PW-5-2014	PW-C
					Sample Type Code	N	N	N	N	N	N	N
					Sample ID	PW-4-A	PW-4-A-F	PW-4-AM	PW-5-A	PW-5-A-F	PW-5-AM	PW-C-AM
					Sample Date	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	8/4/2014
					Depth Interval	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA PW VOCs	N	Trichlorofluoromethane	75-69-4	ug/l								
RA PW VOCs	N	Vinyl Acetate	108-05-4	ug/l								
RA PW VOCs	N	Vinyl Chloride	75-01-4	ug/l								
RA PW VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	0.5 UJ		0.25 U	0.5 UJ		0.25 U	0.25 U
RA PW VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.2 U		0.25 U	0.2 U		0.16 J	0.25 U
RA PW VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	1,1-Dichloroethane	75-34-3	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	1,1-Dichloroethene	75-35-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	1,1-Dichloropropene	563-58-6	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l	0.5 UJ		0.25 U	0.5 UJ		0.25 U	0.25 U
RA PW VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	2 U		0.25 U	2 U		0.25 U	0.25 U
RA PW VOCs	T	1,2-Dibromoethane	106-93-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	1,2-Dichloroethane	107-06-2	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	1,2-Dichloropropane	78-87-5	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	1,3-Dichloropropane	142-28-9	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	2,2-Dichloropropane	594-20-7	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	2-Butanone (MEK)	78-93-3	ug/l	5 U		5 U	5 U		5 U	5 U
RA PW VOCs	T	2-Chlorotoluene	95-49-8	ug/l	0.2 U		0.25 UJ	0.2 U		0.25 UJ	0.25 U
RA PW VOCs	T	2-Hexanone	591-78-6	ug/l	5 U		2.5 U	5 U		2.5 U	2.5 U
RA PW VOCs	T	4-Chlorotoluene	106-43-4	ug/l	0.2 U		0.25 UJ	0.2 U		0.25 UJ	0.25 U
RA PW VOCs	T	4-Isopropyltoluene	99-87-6	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l	5 U		2.5 U	5 U		2.5 U	2.5 U
RA PW VOCs	T	Acetone	67-64-1	ug/l	5 U		5 U	5.2 J		4.3 J	5 U
RA PW VOCs	T	Benzene	71-43-2	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	Bromobenzene	108-86-1	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	Bromochloromethane	74-97-5	ug/l	0.5 U		0.5 U	0.5 U		0.5 U	0.5 U
RA PW VOCs	T	Bromodichloromethane	75-27-4	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	Bromoform	75-25-2	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	Bromomethane	74-83-9	ug/l	1 UJ		0.59 U	1 UJ		0.59 U	0.59 U
RA PW VOCs	T	Carbon Disulfide	75-15-0	ug/l	0.4 J		0.94	0.2 J		0.25 U	0.25 U
RA PW VOCs	T	Carbon Tetrachloride	56-23-5	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	Chlorobenzene	108-90-7	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	Chloroethane	75-00-3	ug/l	1 U		0.25 U	1 U		0.25 U	0.25 U
RA PW VOCs	T	Chloroform	67-66-3	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	Chloromethane	74-87-3	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l	0.5 UJ		0.25 U	0.5 UJ		0.25 U	0.25 U
RA PW VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	dibromochloromethane	124-48-1	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	Dibromomethane	74-95-3	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l	1 U		0.25 U	1 U		0.25 U	0.25 U
RA PW VOCs	T	Diisopropyl Ether	108-20-3	ug/l			0.25 U			0.25 U	0.25 U
RA PW VOCs	T	Ethylbenzene	100-41-4	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	Freon 113	76-13-1	ug/l			0.25 U			0.25 U	0.25 U
RA PW VOCs	T	Hexachlorobutadiene	87-68-3	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	Hexane	110-54-3	ug/l			0.25 U			0.25 U	0.25 U

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	PW-4-2014	PW-4-2014	PW-4-2014	PW-5-2014	PW-5-2014	PW-5-2014	PW-C
					Sample Type Code	N	N	N	N	N	N	N
					Sample ID	PW-4-A	PW-4-A-F	PW-4-AM	PW-5-A	PW-5-A-F	PW-5-AM	PW-C-AM
					Sample Date	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	8/4/2014
					Depth Interval	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA PW VOCs	T	Isopropylbenzene	98-82-8	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	M,P-Xylenes	179601-23-1	ug/l	0.4 U		0.5 U	0.4 U		0.5 U	0.5 U
RA PW VOCs	T	Methylene Chloride	75-09-2	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	Naphthalene	91-20-3	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	n-Butylbenzene	104-51-8	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	n-Propylbenzene	103-65-1	ug/l	0.5 U		0.25 UJ	0.5 U		0.25 UJ	0.25 U
RA PW VOCs	T	O-Xylene	95-47-6	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	sec-Butylbenzene	135-98-8	ug/l	0.2 U		0.25 UJ	0.2 U		0.25 UJ	0.25 U
RA PW VOCs	T	Styrene	100-42-5	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	tert-Butylbenzene	98-06-6	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	Tetrachloroethene	127-18-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	Tetrahydrofuran	109-99-9	ug/l			2.5 U			2.5 U	2.5 U
RA PW VOCs	T	Toluene	108-88-3	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l	0.60 U		0.75 U	0.60 U		0.75 U	0.75 U
RA PW VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.25 U
RA PW VOCs	T	Trichloroethylene	79-01-6	ug/l	0.5 U		0.12 J	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	Trichlorofluoromethane	75-69-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U
RA PW VOCs	T	Vinyl Chloride	75-01-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.25 U

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location Group					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location ID					PW-E	PW-F	PW-F	PW-H	PW-I	PW-TS1A	PW-TS1C
Sample Type Code					N	N	FD	N	N	N	N
Sample ID					PW-E-AM	PW-F-AM	PW-F-AM-DUP	PW-H-AM	PW-I-AM	PW-TS1A-AM	PW-TS1C-AM
Sample Date					8/4/2014	8/4/2014	8/4/2014	8/1/2014	8/1/2014	8/4/2014	8/4/2014
Depth Interval					2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units							
RA PW Metals	D	Arsenic	7440-38-2	ug/l							
RA PW Metals	D	Barium	7440-39-3	ug/l							
RA PW Metals	D	Cadmium	7440-43-9	ug/l							
RA PW Metals	D	Chromium	7440-47-3	ug/l							
RA PW Metals	D	Lead	7439-92-1	ug/l							
RA PW Metals	D	Mercury	7439-97-6	ug/l							
RA PW Metals	D	Selenium	7782-49-2	ug/l							
RA PW Metals	D	Silver	7440-22-4	ug/l							
RA PW Metals	T	Arsenic	7440-38-2	ug/l							
RA PW Metals	T	Barium	7440-39-3	ug/l							
RA PW Metals	T	Cadmium	7440-43-9	ug/l							
RA PW Metals	T	Chromium	7440-47-3	ug/l							
RA PW Metals	T	Lead	7439-92-1	ug/l							
RA PW Metals	T	Mercury	7439-97-6	ug/l							
RA PW Metals	T	Selenium	7782-49-2	ug/l							
RA PW Metals	T	Silver	7440-22-4	ug/l							
RA PW PCBs	D	Aroclor 1016	12674-11-2	ug/l							
RA PW PCBs	D	Aroclor 1221	11104-28-2	ug/l							
RA PW PCBs	D	Aroclor 1232	11141-16-5	ug/l							
RA PW PCBs	D	Aroclor 1242	53469-21-9	ug/l							
RA PW PCBs	D	Aroclor 1248	12672-29-6	ug/l							
RA PW PCBs	D	Aroclor 1254	11097-69-1	ug/l							
RA PW PCBs	D	Aroclor 1260	11096-82-5	ug/l							
RA PW PCBs	D	Aroclor 1262	37324-23-5	ug/l							
RA PW PCBs	D	Aroclor 1268	11100-14-4	ug/l							
RA PW PCBs	D	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l							
RA PW PCBs	N	Aroclor 1016	12674-11-2	ug/l							
RA PW PCBs	N	Aroclor 1221	11104-28-2	ug/l							
RA PW PCBs	N	Aroclor 1232	11141-16-5	ug/l							
RA PW PCBs	N	Aroclor 1242	53469-21-9	ug/l							
RA PW PCBs	N	Aroclor 1248	12672-29-6	ug/l							
RA PW PCBs	N	Aroclor 1254	11097-69-1	ug/l							
RA PW PCBs	N	Aroclor 1260	11096-82-5	ug/l							
RA PW PCBs	N	Aroclor 1262	37324-23-5	ug/l							
RA PW PCBs	N	Aroclor 1268	11100-14-4	ug/l							
RA PW PCBs	N	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l							
RA PW VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l							
RA PW VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l							
RA PW VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l							
RA PW VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l							
RA PW VOCs	N	1,1-Dichloroethane	75-34-3	ug/l							
RA PW VOCs	N	1,1-Dichloroethene	75-35-4	ug/l							
RA PW VOCs	N	1,1-Dichloropropene	563-58-6	ug/l							
RA PW VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l							
RA PW VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l							
RA PW VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l							
RA PW VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l							
RA PW VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l							
RA PW VOCs	N	1,2-Dibromoethane	106-93-4	ug/l							
RA PW VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l							
RA PW VOCs	N	1,2-Dichloroethane	107-06-2	ug/l							
RA PW VOCs	N	1,2-Dichloropropane	78-87-5	ug/l							
RA PW VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l							

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location Group					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location ID					PW-E	PW-F	PW-F	PW-H	PW-I	PW-TS1A	PW-TS1C
Sample Type Code					N	N	FD	N	N	N	N
Sample ID					PW-E-AM	PW-F-AM	PW-F-AM-DUP	PW-H-AM	PW-I-AM	PW-TS1A-AM	PW-TS1C-AM
Sample Date					8/4/2014	8/4/2014	8/4/2014	8/1/2014	8/1/2014	8/4/2014	8/4/2014
Depth Interval					2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units							
RA PW VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l							
RA PW VOCs	N	1,3-Dichloropropane	142-28-9	ug/l							
RA PW VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l							
RA PW VOCs	N	1-Chlorohexane	544-10-5	ug/l							
RA PW VOCs	N	2,2-Dichloropropane	594-20-7	ug/l							
RA PW VOCs	N	2-Butanone (MEK)	78-93-3	ug/l							
RA PW VOCs	N	2-Chlorotoluene	95-49-8	ug/l							
RA PW VOCs	N	2-Hexanone	591-78-6	ug/l							
RA PW VOCs	N	4-Chlorotoluene	106-43-4	ug/l							
RA PW VOCs	N	4-Isopropyltoluene	99-87-6	ug/l							
RA PW VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l							
RA PW VOCs	N	Acetone	67-64-1	ug/l							
RA PW VOCs	N	Benzene	71-43-2	ug/l							
RA PW VOCs	N	Bromobenzene	108-86-1	ug/l							
RA PW VOCs	N	Bromochloromethane	74-97-5	ug/l							
RA PW VOCs	N	Bromodichloromethane	75-27-4	ug/l							
RA PW VOCs	N	Bromoform	75-25-2	ug/l							
RA PW VOCs	N	Bromomethane	74-83-9	ug/l							
RA PW VOCs	N	Carbon Disulfide	75-15-0	ug/l							
RA PW VOCs	N	Carbon Tetrachloride	56-23-5	ug/l							
RA PW VOCs	N	Chlorobenzene	108-90-7	ug/l							
RA PW VOCs	N	Chloroethane	75-00-3	ug/l							
RA PW VOCs	N	Chloroform	67-66-3	ug/l							
RA PW VOCs	N	Chloromethane	74-87-3	ug/l							
RA PW VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l							
RA PW VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l							
RA PW VOCs	N	Cyclohexane	110-82-7	ug/l							
RA PW VOCs	N	dibromochloromethane	124-48-1	ug/l							
RA PW VOCs	N	Dibromomethane	74-95-3	ug/l							
RA PW VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l							
RA PW VOCs	N	Ethylbenzene	100-41-4	ug/l							
RA PW VOCs	N	Freon 113	76-13-1	ug/l							
RA PW VOCs	N	Hexachlorobutadiene	87-68-3	ug/l							
RA PW VOCs	N	Isopropylbenzene	98-82-8	ug/l							
RA PW VOCs	N	M,P-Xylenes	179601-23-1	ug/l							
RA PW VOCs	N	Methyl Acetate	79-20-9	ug/l							
RA PW VOCs	N	Methylcyclohexane	108-87-2	ug/l							
RA PW VOCs	N	Methylene Chloride	75-09-2	ug/l							
RA PW VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l							
RA PW VOCs	N	Naphthalene	91-20-3	ug/l							
RA PW VOCs	N	n-Butylbenzene	104-51-8	ug/l							
RA PW VOCs	N	n-Propylbenzene	103-65-1	ug/l							
RA PW VOCs	N	O-Xylene	95-47-6	ug/l							
RA PW VOCs	N	sec-Butylbenzene	135-98-8	ug/l							
RA PW VOCs	N	Styrene	100-42-5	ug/l							
RA PW VOCs	N	tert-Butylbenzene	98-06-6	ug/l							
RA PW VOCs	N	Tetrachloroethene	127-18-4	ug/l							
RA PW VOCs	N	Tetrahydrofuran	109-99-9	ug/l							
RA PW VOCs	N	Toluene	108-88-3	ug/l							
RA PW VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l							
RA PW VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l							
RA PW VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l							
RA PW VOCs	N	Trichloroethylene	79-01-6	ug/l							

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location Group					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location ID					PW-E	PW-F	PW-F	PW-H	PW-I	PW-TS1A	PW-TS1C
Sample Type Code					N	N	FD	N	N	N	N
Sample ID					PW-E-AM	PW-F-AM	PW-F-AM-DUP	PW-H-AM	PW-I-AM	PW-TS1A-AM	PW-TS1C-AM
Sample Date					8/4/2014	8/4/2014	8/4/2014	8/1/2014	8/1/2014	8/4/2014	8/4/2014
Depth Interval					2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units							
RA PW VOCs	N	Trichlorofluoromethane	75-69-4	ug/l							
RA PW VOCs	N	Vinyl Acetate	108-05-4	ug/l							
RA PW VOCs	N	Vinyl Chloride	75-01-4	ug/l							
RA PW VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,1-Dichloroethane	75-34-3	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,1-Dichloroethene	75-35-4	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,1-Dichloropropene	563-58-6	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,2-Dibromoethane	106-93-4	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,2-Dichloroethane	107-06-2	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,2-Dichloropropane	78-87-5	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,3-Dichloropropane	142-28-9	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	2,2-Dichloropropane	594-20-7	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	2-Butanone (MEK)	78-93-3	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
RA PW VOCs	T	2-Chlorotoluene	95-49-8	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	2-Hexanone	591-78-6	ug/l	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
RA PW VOCs	T	4-Chlorotoluene	106-43-4	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	4-Isopropyltoluene	99-87-6	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
RA PW VOCs	T	Acetone	67-64-1	ug/l	5 U	5 U	5 U	5 U	4.4 J	5 U	5 U
RA PW VOCs	T	Benzene	71-43-2	ug/l	0.25 U	0.25 U	0.25 U	0.13 J	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Bromobenzene	108-86-1	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Bromochloromethane	74-97-5	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA PW VOCs	T	Bromodichloromethane	75-27-4	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Bromoform	75-25-2	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Bromomethane	74-83-9	ug/l	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U
RA PW VOCs	T	Carbon Disulfide	75-15-0	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Carbon Tetrachloride	56-23-5	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Chlorobenzene	108-90-7	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Chloroethane	75-00-3	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Chloroform	67-66-3	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Chloromethane	74-87-3	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l	0.25 U	0.25 U	0.25 U	1.7	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	dibromochloromethane	124-48-1	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Dibromomethane	74-95-3	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Diisopropyl Ether	108-20-3	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Ethylbenzene	100-41-4	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Freon 113	76-13-1	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Hexachlorobutadiene	87-68-3	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Hexane	110-54-3	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

ATTACHMENT A, TABLE A-4C
POREWATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location Group					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location ID					PW-E	PW-F	PW-F	PW-H	PW-I	PW-TS1A	PW-TS1C
Sample Type Code					N	N	FD	N	N	N	N
Sample ID					PW-E-AM	PW-F-AM	PW-F-AM-DUP	PW-H-AM	PW-I-AM	PW-TS1A-AM	PW-TS1C-AM
Sample Date					8/4/2014	8/4/2014	8/4/2014	8/1/2014	8/1/2014	8/4/2014	8/4/2014
Depth Interval					2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft	2.7 - 3 ft
Method Analyte Group	Fraction	Compound	CAS #	Units							
RA PW VOCs	T	Isopropylbenzene	98-82-8	ug/l	0.25 U	0.25 U	0.25 U	0.76	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	M,P-Xylenes	179601-23-1	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
RA PW VOCs	T	Methylene Chloride	75-09-2	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Naphthalene	91-20-3	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	n-Butylbenzene	104-51-8	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	n-Propylbenzene	103-65-1	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	O-Xylene	95-47-6	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	sec-Butylbenzene	135-98-8	ug/l	0.25 U	0.25 U	0.25 U	1.7	5	0.25 U	0.25 U
RA PW VOCs	T	Styrene	100-42-5	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	tert-Butylbenzene	98-06-6	ug/l	0.25 U	0.25 U	0.25 U	0.81	4.5	0.25 U	0.25 U
RA PW VOCs	T	Tetrachloroethene	127-18-4	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Tetrahydrofuran	109-99-9	ug/l	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
RA PW VOCs	T	Toluene	108-88-3	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	2.8	0.25 U	0.25 U
RA PW VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
RA PW VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Trichloroethylene	79-01-6	ug/l	0.25 U	0.25 U	0.25 U	7.4	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Trichlorofluoromethane	75-69-4	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
RA PW VOCs	T	Vinyl Chloride	75-01-4	ug/l	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-5A
SEDIMENT SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
SE	Background-Tidal Stream North	SED 1	11/30/2011	SED 1A 0-0.5	N		0 - 0.5 ft
SE	Background-Tidal Stream North	SED 1	11/30/2011	SED 1A 0-0.5DUP	FD	SED 1A 0-0.5	0 - 0.5 ft
SE	Background-Tidal Stream North	SED-101-2014	8/5/2014	SED-101-A-2014	N		0 - 0.5 ft
SE	Background-Tidal Stream North	SED-321	10/1/2019	SED-321-CI19-0-0.5	N		0 - 0.5 ft
SE	Background-Tidal Stream North	SED-321	5/28/2020	SED-321-CI20-0-0.5	N		0 - 0.5 ft
SE	Background-Tidal Stream North	SED-322	10/1/2019	SED-322-CI19-0-0.5	N		0 - 0.5 ft
SE	Background-Tidal Stream North	SED-322	10/1/2019	SED-322-CI19-0-0.5-DUP	FD	SED-322-CI19-0-0.5	0 - 0.5 ft
SE	Background-Tidal Stream North	SED-322	5/28/2020	SED-322-CI20-0-0.5	N		0 - 0.5 ft
SE	Background-Tidal Stream North	SED-323	10/1/2019	SED-323-CI19-0-0.5	N		0 - 0.5 ft
SE	Background-Tidal Stream North	SED-323	5/28/2020	SED-323-CI20-0-0.5	N		0 - 0.5 ft
SE	Background-Tidal Stream North	SED-324	10/1/2019	SED-324-CI19-0-0.5	N		0 - 0.5 ft
SE	Background-Tidal Stream North	SED-324	5/28/2020	SED-324-CI20-0-0.5	N		0 - 0.5 ft
SE	Background-Tidal Stream North	SED-325	10/1/2019	SED-325-CI19-0-0.5	N		0 - 0.5 ft
SE	Background-Tidal Stream North	SED-325	5/28/2020	SED-325-CI20-0-0.5	N		0 - 0.5 ft
SE	Background-Beachfront	SED-311	5/22/2020	SED-311-CI20-0-1	N		0 - 1 ft
SE	Background-Beachfront	SED-311	5/22/2020	SED-311-CI20-0-1-DUP	FD	SED-311-CI20-0-1	0 - 1 ft
SE	Background-Beachfront	SED-312	5/22/2020	SED-312-CI20-0-1	N		0 - 1 ft
SE	Background-Beachfront	SED-313	5/22/2020	SED-313-CI20-0-1	N		0 - 1 ft
SE	Background-Beachfront	SED-314	5/22/2020	SED-314-CI20-0-1	N		0 - 1 ft
SE	Background-Beachfront	SED-315	5/22/2020	SED-315-CI20-0-1	N		0 - 1 ft
SE	Background-Beachfront	SED-316	5/22/2020	SED-316-CI20-0-1	N		0 - 1 ft
SE	Background-Beachfront	SED-317	5/22/2020	SED-317-CI20-0-1	N		0 - 1 ft
SE	Background-Beachfront	SED-318	5/22/2020	SED-318-CI20-0-1	N		0 - 1 ft
SE	Background-Beachfront	SED-319	5/22/2020	SED-319-CI20-0-1	N		0 - 1 ft
SE	Background-Beachfront	SED-320	5/22/2020	SED-320-CI20-0-1	N		0 - 1 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED 3	11/30/2011	SED 3A 0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED 3	11/30/2011	SED 3AD 0-0.5	FD	SED 3A 0-0.5	0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED 4	11/29/2011	SED-4A 0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED 4	11/29/2011	SED-4A 0-0.5DUP	FD	SED-4A 0-0.5	0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED 5	11/29/2011	SED-5A 0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-103-2014	8/5/2014	SED-103-A-2014	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-104-2014	8/5/2014	SED-104-A-2014	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-105-2014	8/5/2014	SED-105-A-2014	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-326	10/1/2019	SED-326-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-327	10/1/2019	SED-327-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-328	10/1/2019	SED-328-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-329	10/1/2019	SED-329-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-330	10/1/2019	SED-330-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-331	10/2/2019	SED-331-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-331	5/28/2020	SED-331-CI20-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-332	10/2/2019	SED-332-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-333	10/2/2019	SED-333-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-333	5/28/2020	SED-333-CI20-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-334	10/2/2019	SED-334-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-335	10/2/2019	SED-335-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-335	5/28/2020	SED-335-CI20-0-0.5	N		0 - 0.5 ft

ATTACHMENT A, TABLE A-5A
SEDIMENT SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-336	10/2/2019	SED-336-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-336	10/2/2019	SED-336-CI19-0-0.5-DUP	FD	SED-336-CI19-0-0.5	0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-337	10/2/2019	SED-337-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-337	5/28/2020	SED-337-CI20-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-338	10/2/2019	SED-338-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-339	10/2/2019	SED-339-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-339	5/28/2020	SED-339-CI20-0-0.5	N		0 - 0.5 ft
SE	Off-Project Red Maple Swamp /Tidal Marsh	SED-340	10/2/2019	SED-340-CI19-0-0.5	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	Beach-1-A	7/31/2014	Beach-1-A	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	Beach-2-A	7/31/2014	Beach-2-A	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	Beach-3-A	7/31/2014	Beach-3-A	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	Beach-4-A	7/31/2014	Beach-4-A	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	Beach-5-A	7/31/2014	Beach-5-A	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	Beach-5-A	7/31/2014	Beach-59-A	FD	Beach-5-A	0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	Beach-6-A	7/31/2014	Beach-6-A	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	Beach-7-A	7/31/2014	Beach-7-A	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	Beach-8-A	7/31/2014	Beach-8-A	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-301	10/3/2019	SED-301-CI19-0-1	N		0 - 1 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-301	10/3/2019	SED-301-CI19-0-1-DUP	FD	SED-301-CI19-0-1	0 - 1 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-302	10/3/2019	SED-302-CI19-0-1	N		0 - 1 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-303	10/3/2019	SED-303-CI19-0-1	N		0 - 1 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-304	10/3/2019	SED-304-CI19-0-1	N		0 - 1 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-305	10/3/2019	SED-305-CI19-0-1	N		0 - 1 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-306	10/3/2019	SED-306-CI19-0-1	N		0 - 1 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-307	10/3/2019	SED-307-CI19-0-1	N		0 - 1 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-308	10/3/2019	SED-308-CI19-0-1	N		0 - 1 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-309	10/3/2019	SED-309-CI19-0-1	N		0 - 1 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-310	10/3/2019	SED-310-CI19-0-1	N		0 - 1 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-OFF-10-090115	9/1/2015	SED-OFF-10-090115	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-OFF-10-090115	9/1/2015	SED-OFF-10X-090115	FD	SED-OFF-10-090115	0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-OFF-1-083115	8/31/2015	SED-OFF-1-083115	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-OFF-2-083115	8/31/2015	SED-OFF-2-083115	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-OFF-3-083115	8/31/2015	SED-OFF-3-083115	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-OFF-4-083115	8/31/2015	SED-OFF-4-083115	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-OFF-5-083115	8/31/2015	SED-OFF-5-083115	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-OFF-6-083115	8/31/2015	SED-OFF-6-083115	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-OFF-7-090115	9/1/2015	SED-OFF-7-090115	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-OFF-8-090115	9/1/2015	SED-OFF-8-090115	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-OFF-9-090115	9/1/2015	SED-OFF-9-090115	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-ON-10-082515	8/25/2015	SED-ON-10-082515	N		0 - 0.5 ft
SE	Off-Project Narragansett Bay and Beachfront	SED-ON-9-082515	8/25/2015	SED-ON-9-082515	N		0 - 0.5 ft

Notes:
FD - Field duplicate.
ft - Feet.
N - Normal sample.
SE - Sediment.

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
				Location ID	Beach-1-A	Beach-2-A	Beach-3-A	Beach-4-A	Beach-5-A	Beach-5-A	Beach-6-A	Beach-7-A
				Sample Type Code	N	N	N	N	N	FD	N	N
				Sample ID	Beach-1-A	Beach-2-A	Beach-3-A	Beach-4-A	Beach-5-A	Beach-59-A	Beach-6-A	Beach-7-A
				Sample Date	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_Metals	Aluminum	7429-90-5	mg/kg								
RA_SE_Metals	Antimony	7440-36-0	mg/kg								
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	1.6 J	2.4 J	2 J	2.3 J	3.5 J	2.8 J	2 J	3.1 J
RA_SE_Metals	Barium	7440-39-3	mg/kg	1.8 J	3.8 J	2.3 J	2.3 J	4.6 J	2.4 J	1.9 J	2.5 J
RA_SE_Metals	Beryllium	7440-41-7	mg/kg								
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.3 UJ	0.4 UJ	0.3 UJ	0.5 UJ	0.3 UJ	0.3 UJ	0.4 UJ	0.3 UJ
RA_SE_Metals	Calcium	7440-70-2	mg/kg								
RA_SE_Metals	Chromium	7440-47-3	mg/kg	1.9 J	8.2 J	1.9 J	4.3 J	3.3 J	4.5 J	2.4 J	2.9 J
RA_SE_Metals	Cobalt	7440-48-4	mg/kg								
RA_SE_Metals	Copper	7440-50-8	mg/kg								
RA_SE_Metals	HEXAVALENT CHROMIUM	18540-29-9	mg/kg								
RA_SE_Metals	Iron	7439-89-6	mg/kg								
RA_SE_Metals	Lead	7439-92-1	mg/kg	3.7 J	12.7 J	6.5 J	5.9 J	8.4 J	7.9 J	5.7 J	7.1 J
RA_SE_Metals	Magnesium	7439-95-4	mg/kg								
RA_SE_Metals	Manganese	7439-96-5	mg/kg								
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.011 U	0.016 U	0.011 U	0.013 U	0.011 U	0.014 U	0.011 U	0.013 U
RA_SE_Metals	Nickel	7440-02-0	mg/kg								
RA_SE_Metals	Potassium	7440-09-7	mg/kg								
RA_SE_Metals	Selenium	7782-49-2	mg/kg	3.1 UJ	4.7 UJ	4.1 UJ	6 UJ	3.6 UJ	4.1 UJ	5.3 UJ	3.3 UJ
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.3 UJ	0.4 UJ	0.3 UJ	0.5 UJ	0.3 UJ	0.3 UJ	0.4 UJ	0.3 UJ
RA_SE_Metals	Sodium	7440-23-5	mg/kg								
RA_SE_Metals	Thallium	7440-28-0	mg/kg								
RA_SE_Metals	Vanadium	7440-62-2	mg/kg								
RA_SE_Metals	Zinc	7440-66-6	mg/kg								
RA_SE_Other	Total Organic Carbon	TOC	mg/kg	2610	12000	3020	3080	5980	11500	10200	5270
RA_SE_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg								
RA_SE_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg								
RA_SE_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg								
RA_SE_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg								
RA_SE_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg								
RA_SE_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg								
RA_SE_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg								
RA_SE_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg								
RA_SE_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg								
RA_SE_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0012 U	0.001 U	0.0013 U	0.0014 U	0.0013 U	0.0009 U	0.0013 U	0.0013 U
RA_SE_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,1-Dichloroethane	75-34-3	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,1-Dichloroethene	75-35-4	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,1-Dichloropropene	563-58-6	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
				Location ID	Beach-1-A	Beach-2-A	Beach-3-A	Beach-4-A	Beach-5-A	Beach-5-A	Beach-6-A	Beach-7-A
				Sample Type Code	N	N	N	N	N	FD	N	N
				Sample ID	Beach-1-A	Beach-2-A	Beach-3-A	Beach-4-A	Beach-5-A	Beach-59-A	Beach-6-A	Beach-7-A
				Sample Date	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units									
RA_SE_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,2-Dibromoethane	106-93-4	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,2-Dichloroethane	107-06-2	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,2-Dichloropropane	78-87-5	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,3-Dichloropropane	142-28-9	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	2,2-Dichloropropane	594-20-7	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	2-Butanone (MEK)	78-93-3	mg/kg	0.0062 U	0.0049 U	0.0067 U	0.0068 U	0.0063 U	0.0043 U	0.0065 U	0.0063 U
RA_SE_VOCs	2-Chlorotoluene	95-49-8	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	2-Hexanone	591-78-6	mg/kg	0.0062 U	0.0049 U	0.0067 U	0.0068 U	0.0063 U	0.0043 U	0.0065 U	0.0063 U
RA_SE_VOCs	4-Chlorotoluene	106-43-4	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	4-Isopropyltoluene	99-87-6	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.0062 U	0.0049 U	0.0067 U	0.0068 U	0.0063 U	0.0043 U	0.0065 U	0.0063 U
RA_SE_VOCs	Acetone	67-64-1	mg/kg	0.0062 U	0.0049 U	0.0067 U	0.0068 U	0.0063 U	0.0043 U	0.0065 U	0.0063 U
RA_SE_VOCs	Benzene	71-43-2	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Bromobenzene	108-86-1	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Bromochloromethane	74-97-5	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Bromodichloromethane	75-27-4	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Bromoform	75-25-2	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Bromomethane	74-83-9	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0012 J	0.0025 U	0.0017 U	0.0015 J	0.0025 U
RA_SE_VOCs	Carbon Disulfide	75-15-0	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Carbon Tetrachloride	56-23-5	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Chlorobenzene	108-90-7	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Chloroethane	75-00-3	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Chloroform	67-66-3	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Chloromethane	74-87-3	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	dibromochloromethane	124-48-1	mg/kg	0.0012 U	0.001 U	0.0013 U	0.0014 U	0.0013 U	0.0009 U	0.0013 U	0.0013 U
RA_SE_VOCs	Dibromomethane	74-95-3	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Ethylbenzene	100-41-4	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Hexachlorobutadiene	87-68-3	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Isopropylbenzene	98-82-8	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	M,P-Xylenes	179601-23-1	mg/kg	0.0049 U	0.0039 U	0.0054 U	0.0054 U	0.005 U	0.0034 U	0.0052 U	0.005 U
RA_SE_VOCs	Methylene Chloride	75-09-2	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
			Location ID	Beach-1-A	Beach-2-A	Beach-3-A	Beach-4-A	Beach-5-A	Beach-5-A	Beach-6-A	Beach-7-A
			Sample Type Code	N	N	N	N	N	FD	N	N
			Sample ID	Beach-1-A	Beach-2-A	Beach-3-A	Beach-4-A	Beach-5-A	Beach-59-A	Beach-6-A	Beach-7-A
			Sample Date	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014
			Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Naphthalene	91-20-3	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	n-Butylbenzene	104-51-8	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	n-Propylbenzene	103-65-1	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	O-Xylene	95-47-6	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	sec-Butylbenzene	135-98-8	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Styrene	100-42-5	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	tert-Butylbenzene	98-06-6	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Tetrachloroethene	127-18-4	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Toluene	108-88-3	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.0074 U	0.0058 U	0.0081 U	0.0081 U	0.0075 U	0.0051 U	0.0078 U	0.0075 U
RA_SE_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Trichloroethylene	79-01-6	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Trichlorofluoromethane	75-69-4	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U
RA_SE_VOCs	Vinyl Chloride	75-01-4	mg/kg	0.0025 U	0.0019 U	0.0027 U	0.0027 U	0.0025 U	0.0017 U	0.0026 U	0.0025 U

Notes:
CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
				Location ID	Beach-8-A	SED-301	SED-301	SED-302	SED-303	SED-304	SED-305
				Sample Type Code	N	N	FD	N	N	N	N
				Sample ID	Beach-8-A	SED-301-CI19-0-1	SED-301-CI19-0-1-DUP	SED-302-CI19-0-1	SED-303-CI19-0-1	SED-304-CI19-0-1	SED-305-CI19-0-1
				Sample Date	7/31/2014	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019
				Depth Interval	0 - 0.5 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_Metals	Aluminum	7429-90-5	mg/kg		2310	2250	1890	2320	1780	10600	
RA_SE_Metals	Antimony	7440-36-0	mg/kg		0.0170 J	0.0180 J	0.0290 J	0.0300 J	0.0190 J	0.0220 J	
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	2.3 J	1.00	1.10	1.20	1.08	0.930	1.50 J	
RA_SE_Metals	Barium	7440-39-3	mg/kg	8 J	7.45 J	3.48 J	2.76	3.96	4.32	3.15	
RA_SE_Metals	Beryllium	7440-41-7	mg/kg		0.225	0.214	0.183	0.218	1.58	0.372	
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.4 UJ	0.0150 J	0.0170 J	0.0160 J	0.0180 J	0.0140 J	0.0909	
RA_SE_Metals	Calcium	7440-70-2	mg/kg		315	244	280	240	225	518 J	
RA_SE_Metals	Chromium	7440-47-3	mg/kg	3.9 J	2.20	2.96	3.94	3.48	7.18	11.7 J	
RA_SE_Metals	Cobalt	7440-48-4	mg/kg		1.24	1.50	1.08	1.29	1.74	3.92	
RA_SE_Metals	Copper	7440-50-8	mg/kg		2.15	2.95	2.53	11.4	14.1	12.9 J	
RA_SE_Metals	HEXAVALENT CHROMIUM	18540-29-9	mg/kg								
RA_SE_Metals	Iron	7439-89-6	mg/kg		5050	4380	4480	4620	3960	17200 J	
RA_SE_Metals	Lead	7439-92-1	mg/kg	4.3 J	4.32	4.16	7.91	20.8	15.4	13.2 J	
RA_SE_Metals	Magnesium	7439-95-4	mg/kg		974	1030	918	1010	636	4390	
RA_SE_Metals	Manganese	7439-96-5	mg/kg		74.3	50.8	47.6	46.6	47.1	233 J	
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.017 U	0.019 U	0.018 U	0.00580 J	0.016 U	0.016 U	0.018 U	
RA_SE_Metals	Nickel	7440-02-0	mg/kg		2.46	2.76	2.82	7.42	6.89	8.10 J	
RA_SE_Metals	Potassium	7440-09-7	mg/kg		792 J	390 J	330	405	280	297	
RA_SE_Metals	Selenium	7782-49-2	mg/kg	4.9 UJ	0.26 U	0.24 U	0.29 U	0.19 U	0.0420 J	0.0590 J	
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.4 UJ	0.0100 J	0.00850 J	0.00940 J	0.00920 J	0.0120 J	0.0110 J	
RA_SE_Metals	Sodium	7440-23-5	mg/kg		1110	1040	1300	868	818	832	
RA_SE_Metals	Thallium	7440-28-0	mg/kg		0.0380 J	0.0320 J	0.0230 J	0.0350 J	0.0220 J	0.0270 J	
RA_SE_Metals	Vanadium	7440-62-2	mg/kg		5.35	4.30	3.78	4.72	3.00	10.3 J	
RA_SE_Metals	Zinc	7440-66-6	mg/kg		21.2	21.5	22.0	20.5	64.0	44.1 J	
RA_SE_Other	Total Organic Carbon	TOC	mg/kg	4070	5000 J	2800 J	4000	3300	10000	3200 J	
RA_SE_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg		0.0092 U	0.0087 U	0.0088 U	0.0084 U	0.0091 U	0.0091 U	
RA_SE_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg		0.0092 U	0.0087 U	0.0088 U	0.0084 U	0.0091 U	0.0091 U	
RA_SE_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg		0.011 U	0.01 U	0.01 U	0.0099 U	0.011 U	0.011 U	
RA_SE_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg		0.0092 U	0.0087 U	0.0088 U	0.0084 U	0.0091 U	0.0091 U	
RA_SE_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg		0.0092 U	0.0087 U	0.0088 U	0.0084 U	0.0091 U	0.0091 U	
RA_SE_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg		0.0092 U	0.0087 U	0.0088 U	0.0084 U	0.0091 U	0.0091 U	
RA_SE_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg		0.0170 J	0.0150 J	0.0170 J	0.0240	0.0200	0.0190	
RA_SE_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg		0.0170 J	0.0150 J	0.0170 J	0.0240 J	0.0200 J	0.0190 J	
RA_SE_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg		0.074	0.069	0.071	0.076	0.077	0.076	
RA_SE_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0027 U							
RA_SE_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0027 U							
RA_SE_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0013 U							
RA_SE_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0027 U							
RA_SE_VOCs	1,1-Dichloroethane	75-34-3	mg/kg	0.0027 U							
RA_SE_VOCs	1,1-Dichloroethene	75-35-4	mg/kg	0.0027 U							
RA_SE_VOCs	1,1-Dichloropropene	563-58-6	mg/kg	0.0027 U							
RA_SE_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0027 U							

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
				Location ID	Beach-8-A	SED-301	SED-301	SED-302	SED-303	SED-304	SED-305
				Sample Type Code	N	N	FD	N	N	N	N
				Sample ID	Beach-8-A	SED-301-CI19-0-1	SED-301-CI19-0-1-DUP	SED-302-CI19-0-1	SED-303-CI19-0-1	SED-304-CI19-0-1	SED-305-CI19-0-1
				Sample Date	7/31/2014	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019
				Depth Interval	0 - 0.5 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0027 U							
RA_SE_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0027 U							
RA_SE_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0027 U							
RA_SE_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0027 U							
RA_SE_VOCs	1,2-Dibromoethane	106-93-4	mg/kg	0.0027 U							
RA_SE_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0027 U							
RA_SE_VOCs	1,2-Dichloroethane	107-06-2	mg/kg	0.0027 U							
RA_SE_VOCs	1,2-Dichloropropane	78-87-5	mg/kg	0.0027 U							
RA_SE_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0027 U							
RA_SE_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0027 U							
RA_SE_VOCs	1,3-Dichloropropane	142-28-9	mg/kg	0.0027 U							
RA_SE_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0027 U							
RA_SE_VOCs	2,2-Dichloropropane	594-20-7	mg/kg	0.0027 U							
RA_SE_VOCs	2-Butanone (MEK)	78-93-3	mg/kg	0.0067 U							
RA_SE_VOCs	2-Chlorotoluene	95-49-8	mg/kg	0.0027 U							
RA_SE_VOCs	2-Hexanone	591-78-6	mg/kg	0.0067 U							
RA_SE_VOCs	4-Chlorotoluene	106-43-4	mg/kg	0.0027 U							
RA_SE_VOCs	4-Isopropyltoluene	99-87-6	mg/kg	0.0027 U							
RA_SE_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.0067 U							
RA_SE_VOCs	Acetone	67-64-1	mg/kg	0.0067 U							
RA_SE_VOCs	Benzene	71-43-2	mg/kg	0.0027 U							
RA_SE_VOCs	Bromobenzene	108-86-1	mg/kg	0.0027 U							
RA_SE_VOCs	Bromochloromethane	74-97-5	mg/kg	0.0027 U							
RA_SE_VOCs	Bromodichloromethane	75-27-4	mg/kg	0.0027 U							
RA_SE_VOCs	Bromoform	75-25-2	mg/kg	0.0027 U							
RA_SE_VOCs	Bromomethane	74-83-9	mg/kg	0.0027 U							
RA_SE_VOCs	Carbon Disulfide	75-15-0	mg/kg	0.0027 U							
RA_SE_VOCs	Carbon Tetrachloride	56-23-5	mg/kg	0.0027 U							
RA_SE_VOCs	Chlorobenzene	108-90-7	mg/kg	0.0027 U							
RA_SE_VOCs	Chloroethane	75-00-3	mg/kg	0.0027 U							
RA_SE_VOCs	Chloroform	67-66-3	mg/kg	0.0027 U							
RA_SE_VOCs	Chloromethane	74-87-3	mg/kg	0.0027 U							
RA_SE_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0027 U							
RA_SE_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0027 U							
RA_SE_VOCs	dibromochloromethane	124-48-1	mg/kg	0.0013 U							
RA_SE_VOCs	Dibromomethane	74-95-3	mg/kg	0.0027 U							
RA_SE_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0027 U							
RA_SE_VOCs	Ethylbenzene	100-41-4	mg/kg	0.0027 U							
RA_SE_VOCs	Hexachlorobutadiene	87-68-3	mg/kg	0.0027 U							
RA_SE_VOCs	Isopropylbenzene	98-82-8	mg/kg	0.0027 U							
RA_SE_VOCs	M,P-Xylenes	179601-23-1	mg/kg	0.0054 U							
RA_SE_VOCs	Methylene Chloride	75-09-2	mg/kg	0.0027 U							

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
				Location ID	Beach-8-A	SED-301	SED-301	SED-302	SED-303	SED-304	SED-305
				Sample Type Code	N	N	FD	N	N	N	N
				Sample ID	Beach-8-A	SED-301-CI19-0-1	SED-301-CI19-0-1-DUP	SED-302-CI19-0-1	SED-303-CI19-0-1	SED-304-CI19-0-1	SED-305-CI19-0-1
				Sample Date	7/31/2014	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019
				Depth Interval	0 - 0.5 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0027 U							
RA_SE_VOCs	Naphthalene	91-20-3	mg/kg	0.0027 U							
RA_SE_VOCs	n-Butylbenzene	104-51-8	mg/kg	0.0027 U							
RA_SE_VOCs	n-Propylbenzene	103-65-1	mg/kg	0.0027 U							
RA_SE_VOCs	O-Xylene	95-47-6	mg/kg	0.0027 U							
RA_SE_VOCs	sec-Butylbenzene	135-98-8	mg/kg	0.0027 U							
RA_SE_VOCs	Styrene	100-42-5	mg/kg	0.0027 U							
RA_SE_VOCs	tert-Butylbenzene	98-06-6	mg/kg	0.0027 U							
RA_SE_VOCs	Tetrachloroethene	127-18-4	mg/kg	0.0027 U							
RA_SE_VOCs	Toluene	108-88-3	mg/kg	0.0027 U							
RA_SE_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.0081 U							
RA_SE_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0027 U							
RA_SE_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0027 U							
RA_SE_VOCs	Trichloroethylene	79-01-6	mg/kg	0.0027 U							
RA_SE_VOCs	Trichlorofluoromethane	75-69-4	mg/kg	0.0027 U							
RA_SE_VOCs	Vinyl Chloride	75-01-4	mg/kg	0.0027 U							

Notes:
CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
				Location ID	SED-306	SED-307	SED-308	SED-309	SED-310
				Sample Type Code	N	N	N	N	N
				Sample ID	SED-306-CI19-0-1	SED-307-CI19-0-1	SED-308-CI19-0-1	SED-309-CI19-0-1	SED-310-CI19-0-1
				Sample Date	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019
				Depth Interval	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units						
RA_SE_Metals	Aluminum	7429-90-5	mg/kg	2250	2330	1820	1780	1620
RA_SE_Metals	Antimony	7440-36-0	mg/kg	0.0250 J	0.0430 J	0.042 U	0.0540 J	0.0390 J
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	1.47	1.24	0.960	0.970	1.20
RA_SE_Metals	Barium	7440-39-3	mg/kg	2.87	3.50	3.88	3.06	2.99
RA_SE_Metals	Beryllium	7440-41-7	mg/kg	0.211	0.291	0.271	0.180	0.259
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.0280 J	0.0180 J	0.0160 J	0.0160 J	0.0230 J
RA_SE_Metals	Calcium	7440-70-2	mg/kg	352	344	295	243	289
RA_SE_Metals	Chromium	7440-47-3	mg/kg	4.12	6.07	4.37	9.79	3.85
RA_SE_Metals	Cobalt	7440-48-4	mg/kg	1.45	1.70	1.02	1.09	1.12
RA_SE_Metals	Copper	7440-50-8	mg/kg	3.78	8.30	3.12	2.49	7.02
RA_SE_Metals	HEXAVALENT CHROMIUM	18540-29-9	mg/kg					
RA_SE_Metals	Iron	7439-89-6	mg/kg	4680	5780	4470	4620	4420
RA_SE_Metals	Lead	7439-92-1	mg/kg	5.79	12.3	5.15	4.40	10.3
RA_SE_Metals	Magnesium	7439-95-4	mg/kg	1030	961	813	738	714
RA_SE_Metals	Manganese	7439-96-5	mg/kg	50.0	61.2	53.9	55.3	55.4
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.018 U	0.00530 J	0.019 U	0.018 U	0.017 U
RA_SE_Metals	Nickel	7440-02-0	mg/kg	4.19	6.08	3.01	6.53	5.08
RA_SE_Metals	Potassium	7440-09-7	mg/kg	322	301	430	362	296
RA_SE_Metals	Selenium	7782-49-2	mg/kg	0.22 U	0.0320 J	0.25 U	0.21 U	0.25 U
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.00980 J	0.0140 J	0.00730 J	0.00850 J	0.0120 J
RA_SE_Metals	Sodium	7440-23-5	mg/kg	1100	1060	1340	1030	999
RA_SE_Metals	Thallium	7440-28-0	mg/kg	0.0300 J	0.0240 J	0.0310 J	0.0300 J	0.0220 J
RA_SE_Metals	Vanadium	7440-62-2	mg/kg	4.53	6.77	4.52	4.02	4.15
RA_SE_Metals	Zinc	7440-66-6	mg/kg	22.4	39.0	18.0	17.2	33.8
RA_SE_Other	Total Organic Carbon	TOC	mg/kg					
RA_SE_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.0092 U	0.0087 U	0.0087 U	0.0089 U	0.0094 U
RA_SE_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.0092 U	0.0087 U	0.0087 U	0.0089 U	0.0094 U
RA_SE_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.011 U	0.01 U	0.01 U	0.01 U	0.011 U
RA_SE_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.0092 U	0.0087 U	0.0087 U	0.0089 U	0.0094 U
RA_SE_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.0092 U	0.0087 U	0.0087 U	0.0089 U	0.0094 U
RA_SE_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.0092 U	0.0087 U	0.0087 U	0.0089 U	0.0094 U
RA_SE_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.0190	0.0160 J	0.0170	0.0220	0.0250
RA_SE_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.0190 J	0.0160 J	0.0170 J	0.0220 J	0.0250 J
RA_SE_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.076	0.070	0.071	0.077	0.083
RA_SE_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg					
RA_SE_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg					
RA_SE_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg					
RA_SE_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg					
RA_SE_VOCs	1,1-Dichloroethane	75-34-3	mg/kg					
RA_SE_VOCs	1,1-Dichloroethene	75-35-4	mg/kg					
RA_SE_VOCs	1,1-Dichloropropene	563-58-6	mg/kg					
RA_SE_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg					

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
				Location ID	SED-306	SED-307	SED-308	SED-309	SED-310
				Sample Type Code	N	N	N	N	N
				Sample ID	SED-306-CI19-0-1	SED-307-CI19-0-1	SED-308-CI19-0-1	SED-309-CI19-0-1	SED-310-CI19-0-1
				Sample Date	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019
				Depth Interval	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units						
RA_SE_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg						
RA_SE_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg						
RA_SE_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg						
RA_SE_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg						
RA_SE_VOCs	1,2-Dibromoethane	106-93-4	mg/kg						
RA_SE_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg						
RA_SE_VOCs	1,2-Dichloroethane	107-06-2	mg/kg						
RA_SE_VOCs	1,2-Dichloropropane	78-87-5	mg/kg						
RA_SE_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg						
RA_SE_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg						
RA_SE_VOCs	1,3-Dichloropropane	142-28-9	mg/kg						
RA_SE_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg						
RA_SE_VOCs	2,2-Dichloropropane	594-20-7	mg/kg						
RA_SE_VOCs	2-Butanone (MEK)	78-93-3	mg/kg						
RA_SE_VOCs	2-Chlorotoluene	95-49-8	mg/kg						
RA_SE_VOCs	2-Hexanone	591-78-6	mg/kg						
RA_SE_VOCs	4-Chlorotoluene	106-43-4	mg/kg						
RA_SE_VOCs	4-Isopropyltoluene	99-87-6	mg/kg						
RA_SE_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg						
RA_SE_VOCs	Acetone	67-64-1	mg/kg						
RA_SE_VOCs	Benzene	71-43-2	mg/kg						
RA_SE_VOCs	Bromobenzene	108-86-1	mg/kg						
RA_SE_VOCs	Bromochloromethane	74-97-5	mg/kg						
RA_SE_VOCs	Bromodichloromethane	75-27-4	mg/kg						
RA_SE_VOCs	Bromoform	75-25-2	mg/kg						
RA_SE_VOCs	Bromomethane	74-83-9	mg/kg						
RA_SE_VOCs	Carbon Disulfide	75-15-0	mg/kg						
RA_SE_VOCs	Carbon Tetrachloride	56-23-5	mg/kg						
RA_SE_VOCs	Chlorobenzene	108-90-7	mg/kg						
RA_SE_VOCs	Chloroethane	75-00-3	mg/kg						
RA_SE_VOCs	Chloroform	67-66-3	mg/kg						
RA_SE_VOCs	Chloromethane	74-87-3	mg/kg						
RA_SE_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg						
RA_SE_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg						
RA_SE_VOCs	dibromochloromethane	124-48-1	mg/kg						
RA_SE_VOCs	Dibromomethane	74-95-3	mg/kg						
RA_SE_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg						
RA_SE_VOCs	Ethylbenzene	100-41-4	mg/kg						
RA_SE_VOCs	Hexachlorobutadiene	87-68-3	mg/kg						
RA_SE_VOCs	Isopropylbenzene	98-82-8	mg/kg						
RA_SE_VOCs	M,P-Xylenes	179601-23-1	mg/kg						
RA_SE_VOCs	Methylene Chloride	75-09-2	mg/kg						

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
				Location ID	SED-306	SED-307	SED-308	SED-309	SED-310
				Sample Type Code	N	N	N	N	N
				Sample ID	SED-306-CI19-0-1	SED-307-CI19-0-1	SED-308-CI19-0-1	SED-309-CI19-0-1	SED-310-CI19-0-1
				Sample Date	10/3/2019	10/3/2019	10/3/2019	10/3/2019	10/3/2019
				Depth Interval	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
Method Analyte Group	Compound	CAS #	Units						
RA_SE_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg						
RA_SE_VOCs	Naphthalene	91-20-3	mg/kg						
RA_SE_VOCs	n-Butylbenzene	104-51-8	mg/kg						
RA_SE_VOCs	n-Propylbenzene	103-65-1	mg/kg						
RA_SE_VOCs	O-Xylene	95-47-6	mg/kg						
RA_SE_VOCs	sec-Butylbenzene	135-98-8	mg/kg						
RA_SE_VOCs	Styrene	100-42-5	mg/kg						
RA_SE_VOCs	tert-Butylbenzene	98-06-6	mg/kg						
RA_SE_VOCs	Tetrachloroethene	127-18-4	mg/kg						
RA_SE_VOCs	Toluene	108-88-3	mg/kg						
RA_SE_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg						
RA_SE_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg						
RA_SE_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg						
RA_SE_VOCs	Trichloroethylene	79-01-6	mg/kg						
RA_SE_VOCs	Trichlorofluoromethane	75-69-4	mg/kg						
RA_SE_VOCs	Vinyl Chloride	75-01-4	mg/kg						

Notes:
CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
			Location ID	SED-OFF-10-090115	SED-OFF-10-090115	SED-OFF-1-083115	SED-OFF-2-083115	SED-OFF-3-083115	SED-OFF-4-083115	SED-OFF-5-083115	SED-OFF-6-083115
			Sample Type Code	N	FD	N	N	N	N	N	N
			Sample ID	SED-OFF-10-090115	SED-OFF-10X-090115	SED-OFF-1-083115	SED-OFF-2-083115	SED-OFF-3-083115	SED-OFF-4-083115	SED-OFF-5-083115	SED-OFF-6-083115
			Sample Date	9/1/2015	9/1/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015
			Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_Metals	Aluminum	7429-90-5	mg/kg								
RA_SE_Metals	Antimony	7440-36-0	mg/kg								
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	1.5	1.5	1.3	1	1.1	1.3	1.2	1.3
RA_SE_Metals	Barium	7440-39-3	mg/kg	2.4 J	2.6 J	2.5 U	2.3 U	2.4 U	2.4 U	2.4 U	2.4 U
RA_SE_Metals	Beryllium	7440-41-7	mg/kg								
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.18 U	0.2 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
RA_SE_Metals	Calcium	7440-70-2	mg/kg								
RA_SE_Metals	Chromium	7440-47-3	mg/kg	4.3	5.3	3.3	5.2	2.8	3.8	3.2	2.9
RA_SE_Metals	Cobalt	7440-48-4	mg/kg								
RA_SE_Metals	Copper	7440-50-8	mg/kg								
RA_SE_Metals	HEXAVALENT CHROMIUM	18540-29-9	mg/kg	0.41 UJ	0.42 UJ						
RA_SE_Metals	Iron	7439-89-6	mg/kg								
RA_SE_Metals	Lead	7439-92-1	mg/kg	5.2 J	4.4 J	4.3 J	3.1 J	2.7 J	3.4 J	2.9 J	3 J
RA_SE_Metals	Magnesium	7439-95-4	mg/kg								
RA_SE_Metals	Manganese	7439-96-5	mg/kg								
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.028 U	0.027 U	0.025 U	0.025 U	0.026 U	0.027 U	0.03 U	0.026 U
RA_SE_Metals	Nickel	7440-02-0	mg/kg								
RA_SE_Metals	Potassium	7440-09-7	mg/kg								
RA_SE_Metals	Selenium	7782-49-2	mg/kg	0.46 U	0.5 U	0.49 U	0.46 U	0.48 U	0.47 U	0.47 U	0.49 U
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.23 U	0.25 U	0.25 U	0.23 U	0.24 U	0.24 U	0.24 U	0.24 U
RA_SE_Metals	Sodium	7440-23-5	mg/kg								
RA_SE_Metals	Thallium	7440-28-0	mg/kg								
RA_SE_Metals	Vanadium	7440-62-2	mg/kg								
RA_SE_Metals	Zinc	7440-66-6	mg/kg								
RA_SE_Other	Total Organic Carbon	TOC	mg/kg	2880	2090	3030	2610	2550	3290	2560	3960
RA_SE_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg								
RA_SE_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg								
RA_SE_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg								
RA_SE_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg								
RA_SE_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg								
RA_SE_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg								
RA_SE_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg								
RA_SE_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg								
RA_SE_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg								
RA_SE_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.00059 UJ	0.00066 UJ	0.0007 UJ	0.00064 UJ	0.00063 UJ	0.00063 UJ	0.00058 UJ	0.00062 UJ
RA_SE_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 U	0.00031 U
RA_SE_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 U	0.00031 U
RA_SE_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	1,1-Dichloroethane	75-34-3	mg/kg	0.00029 UJ	0.00033 UJ	0.00035 UJ	0.00032 UJ	0.00032 UJ	0.00032 UJ	0.00029 UJ	0.00031 UJ
RA_SE_VOCs	1,1-Dichloroethene	75-35-4	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	1,1-Dichloropropene	563-58-6	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 U	0.00031 U
RA_SE_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.00059 UJ	0.00066 UJ	0.0007 UJ	0.00064 UJ	0.00063 UJ	0.00063 UJ	0.00058 UJ	0.00062 UJ

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
			Location ID	SED-OFF-10-090115	SED-OFF-10-090115	SED-OFF-1-083115	SED-OFF-2-083115	SED-OFF-3-083115	SED-OFF-4-083115	SED-OFF-5-083115	SED-OFF-6-083115
			Sample Type Code	N	FD	N	N	N	N	N	N
			Sample ID	SED-OFF-10-090115	SED-OFF-10X-090115	SED-OFF-1-083115	SED-OFF-2-083115	SED-OFF-3-083115	SED-OFF-4-083115	SED-OFF-5-083115	SED-OFF-6-083115
			Sample Date	9/1/2015	9/1/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015
			Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.00059 UJ	0.00066 UJ	0.0007 UJ	0.00064 UJ	0.00063 UJ	0.00063 UJ	0.00058 UJ	0.00062 UJ
RA_SE_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0012 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U	0.0013 U	0.0012 U	0.0012 U
RA_SE_VOCs	1,2-Dibromoethane	106-93-4	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.00029 UJ	0.00033 UJ	0.00035 UJ	0.00032 UJ	0.00032 UJ	0.00032 UJ	0.00029 UJ	0.00031 UJ
RA_SE_VOCs	1,2-Dichloroethane	107-06-2	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	1,2-Dichloropropane	78-87-5	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.00029 UJ	0.00033 UJ	0.00035 UJ	0.00032 UJ	0.00032 UJ	0.00032 UJ	0.00029 UJ	0.00031 UJ
RA_SE_VOCs	1,3-Dichloropropane	142-28-9	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.00029 UJ	0.00033 UJ	0.00035 UJ	0.00032 UJ	0.00032 UJ	0.00032 UJ	0.00029 UJ	0.00031 UJ
RA_SE_VOCs	2,2-Dichloropropane	594-20-7	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	2-Butanone (MEK)	78-93-3	mg/kg	0.0029 U	0.0033 U	0.0035 U	0.0032 U	0.0032 U	0.0032 U	0.0029 U	0.0031 U
RA_SE_VOCs	2-Chlorotoluene	95-49-8	mg/kg	0.00059 UJ	0.00066 UJ	0.0007 UJ	0.00064 UJ	0.00063 UJ	0.00063 UJ	0.00058 UJ	0.00062 UJ
RA_SE_VOCs	2-Hexanone	591-78-6	mg/kg	0.0012 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U	0.0013 U	0.0012 U	0.0012 U
RA_SE_VOCs	4-Chlorotoluene	106-43-4	mg/kg	0.00059 UJ	0.00066 UJ	0.0007 UJ	0.00064 UJ	0.00063 UJ	0.00063 UJ	0.00058 UJ	0.00062 UJ
RA_SE_VOCs	4-Isopropyltoluene	99-87-6	mg/kg	0.00029 UJ	0.00033 UJ	0.00035 UJ	0.00032 UJ	0.00032 UJ	0.00032 UJ	0.00029 UJ	0.00031 UJ
RA_SE_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.0012 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U	0.0013 U	0.0012 U	0.0012 U
RA_SE_VOCs	Acetone	67-64-1	mg/kg	0.0075	0.0117	0.0035 U	0.0152	0.0137	0.01	0.0102	0.0153
RA_SE_VOCs	Benzene	71-43-2	mg/kg	0.00029 UJ	0.00033 UJ	0.00035 UJ	0.00032 UJ	0.00032 UJ	0.00032 UJ	0.00029 UJ	0.00031 UJ
RA_SE_VOCs	Bromobenzene	108-86-1	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	Bromochloromethane	74-97-5	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	Bromodichloromethane	75-27-4	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	Bromoform	75-25-2	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	Bromomethane	74-83-9	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	Carbon Disulfide	75-15-0	mg/kg	0.0026 J	0.0073	0.0114	0.0084	0.0079	0.0093	0.0105	0.0096
RA_SE_VOCs	Carbon Tetrachloride	56-23-5	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 U	0.00031 U
RA_SE_VOCs	Chlorobenzene	108-90-7	mg/kg	0.00029 UJ	0.00033 UJ	0.00035 UJ	0.00032 UJ	0.00032 UJ	0.00032 UJ	0.00029 UJ	0.00031 UJ
RA_SE_VOCs	Chloroethane	75-00-3	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	Chloroform	67-66-3	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	Chloromethane	74-87-3	mg/kg	0.0012 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U	0.0013 U	0.0012 U	0.0012 U
RA_SE_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 J	0.00031 U
RA_SE_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 U	0.00031 U
RA_SE_VOCs	dibromochloromethane	124-48-1	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	Dibromomethane	74-95-3	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	Ethylbenzene	100-41-4	mg/kg	0.00059 UJ	0.00066 UJ	0.0007 UJ	0.00064 UJ	0.00063 UJ	0.00063 UJ	0.00058 UJ	0.00062 UJ
RA_SE_VOCs	Hexachlorobutadiene	87-68-3	mg/kg	0.00059 UJ	0.00066 UJ	0.0007 UJ	0.00064 UJ	0.00063 UJ	0.00063 UJ	0.00058 UJ	0.00062 UJ
RA_SE_VOCs	Isopropylbenzene	98-82-8	mg/kg	0.00029 UJ	0.00033 UJ	0.00035 UJ	0.00032 UJ	0.00032 UJ	0.00032 UJ	0.00029 UJ	0.00031 UJ
RA_SE_VOCs	M,P-Xylenes	179601-23-1	mg/kg	0.00059 UJ	0.00066 UJ	0.0007 UJ	0.00064 UJ	0.00063 UJ	0.00063 UJ	0.00058 UJ	0.00062 UJ
RA_SE_VOCs	Methylene Chloride	75-09-2	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
			Location ID	SED-OFF-10-090115	SED-OFF-10-090115	SED-OFF-1-083115	SED-OFF-2-083115	SED-OFF-3-083115	SED-OFF-4-083115	SED-OFF-5-083115	SED-OFF-6-083115
			Sample Type Code	N	FD	N	N	N	N	N	N
			Sample ID	SED-OFF-10-090115	SED-OFF-10X-090115	SED-OFF-1-083115	SED-OFF-2-083115	SED-OFF-3-083115	SED-OFF-4-083115	SED-OFF-5-083115	SED-OFF-6-083115
			Sample Date	9/1/2015	9/1/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015	8/31/2015
			Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	Naphthalene	91-20-3	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	n-Butylbenzene	104-51-8	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 U	0.00031 U
RA_SE_VOCs	n-Propylbenzene	103-65-1	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	O-Xylene	95-47-6	mg/kg	0.00029 UJ	0.00033 UJ	0.00035 UJ	0.00032 UJ	0.00032 UJ	0.00032 UJ	0.00029 UJ	0.00031 UJ
RA_SE_VOCs	sec-Butylbenzene	135-98-8	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 U	0.00031 U
RA_SE_VOCs	Styrene	100-42-5	mg/kg	0.00029 UJ	0.00033 UJ	0.00035 UJ	0.00032 UJ	0.00032 UJ	0.00032 UJ	0.00029 UJ	0.00031 UJ
RA_SE_VOCs	tert-Butylbenzene	98-06-6	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 U	0.00031 U
RA_SE_VOCs	Tetrachloroethene	127-18-4	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 U	0.00031 U
RA_SE_VOCs	Toluene	108-88-3	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 U	0.00031 U
RA_SE_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.00088 U	0.00099 U	0.0011 U	0.00096 U	0.00095 U	0.00095 U	0.00087 U	0.00093 U
RA_SE_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 U	0.00031 U
RA_SE_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.00029 U	0.00033 U	0.00035 U	0.00032 U	0.00032 U	0.00032 U	0.00029 U	0.00031 U
RA_SE_VOCs	Trichloroethylene	79-01-6	mg/kg	0.00029 UJ	0.00033 UJ	0.00035 UJ	0.00032 UJ	0.00032 UJ	0.00032 UJ	0.00029 UJ	0.00031 UJ
RA_SE_VOCs	Trichlorofluoromethane	75-69-4	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U
RA_SE_VOCs	Vinyl Chloride	75-01-4	mg/kg	0.00059 U	0.00066 U	0.0007 U	0.00064 U	0.00063 U	0.00063 U	0.00058 U	0.00062 U

Notes:
CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
				Location ID	SED-OFF-7-090115	SED-OFF-8-090115	SED-OFF-9-090115	SED-ON-10-082515	SED-ON-9-082515
				Sample Type Code	N	N	N	N	N
				Sample ID	SED-OFF-7-090115	SED-OFF-8-090115	SED-OFF-9-090115	SED-ON-10-082515	SED-ON-9-082515
				Sample Date	9/1/2015	9/1/2015	9/1/2015	8/25/2015	8/25/2015
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units						
RA_SE_Metals	Aluminum	7429-90-5	mg/kg						
RA_SE_Metals	Antimony	7440-36-0	mg/kg						
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	0.94	1.2	1.1	2	1.3	
RA_SE_Metals	Barium	7440-39-3	mg/kg	2.3 U	2.5 U	7.6	3.1 J	2.5 U	
RA_SE_Metals	Beryllium	7440-41-7	mg/kg						
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	
RA_SE_Metals	Calcium	7440-70-2	mg/kg						
RA_SE_Metals	Chromium	7440-47-3	mg/kg	2.6	2.8	18.2	2.5 J	3.3 J	
RA_SE_Metals	Cobalt	7440-48-4	mg/kg						
RA_SE_Metals	Copper	7440-50-8	mg/kg						
RA_SE_Metals	HEXAVALENT CHROMIUM	18540-29-9	mg/kg				0.37 UJ	0.36 UJ	
RA_SE_Metals	Iron	7439-89-6	mg/kg						
RA_SE_Metals	Lead	7439-92-1	mg/kg	4 J	3.8 J	4.7 J	7.2 J	5.3 J	
RA_SE_Metals	Magnesium	7439-95-4	mg/kg						
RA_SE_Metals	Manganese	7439-96-5	mg/kg						
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.026 U	0.028 U	0.025 U	0.026 U	0.025 U	
RA_SE_Metals	Nickel	7440-02-0	mg/kg						
RA_SE_Metals	Potassium	7440-09-7	mg/kg						
RA_SE_Metals	Selenium	7782-49-2	mg/kg	0.46 U	0.5 U	0.47 U	0.49 U	0.5 U	
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.23 U	0.25 U	0.24 U	0.25 U	0.25 U	
RA_SE_Metals	Sodium	7440-23-5	mg/kg						
RA_SE_Metals	Thallium	7440-28-0	mg/kg						
RA_SE_Metals	Vanadium	7440-62-2	mg/kg						
RA_SE_Metals	Zinc	7440-66-6	mg/kg						
RA_SE_Other	Total Organic Carbon	TOC	mg/kg	4490	2400	3200	2010	2030	
RA_SE_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg						
RA_SE_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg						
RA_SE_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg						
RA_SE_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg						
RA_SE_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg						
RA_SE_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg						
RA_SE_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg						
RA_SE_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg						
RA_SE_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg						
RA_SE_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.00068 UJ	0.00057 UJ	0.00062 UJ	0.00058 U	0.0005 U	
RA_SE_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U	
RA_SE_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U	
RA_SE_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U	
RA_SE_VOCs	1,1-Dichloroethane	75-34-3	mg/kg	0.00034 UJ	0.00029 UJ	0.00031 UJ	0.00029 U	0.00025 U	
RA_SE_VOCs	1,1-Dichloroethene	75-35-4	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U	
RA_SE_VOCs	1,1-Dichloropropene	563-58-6	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U	
RA_SE_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.00068 UJ	0.00057 UJ	0.00062 UJ	0.00058 U	0.0005 U	

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
				Location ID	SED-OFF-7-090115	SED-OFF-8-090115	SED-OFF-9-090115	SED-ON-10-082515	SED-ON-9-082515
				Sample Type Code	N	N	N	N	N
				Sample ID	SED-OFF-7-090115	SED-OFF-8-090115	SED-OFF-9-090115	SED-ON-10-082515	SED-ON-9-082515
				Sample Date	9/1/2015	9/1/2015	9/1/2015	8/25/2015	8/25/2015
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units						
RA_SE_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.00068 UJ	0.00057 UJ	0.00062 UJ	0.00058 U	0.0005 U
RA_SE_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0014 U	0.0011 U	0.0012 U	0.0012 U	0.001 U
RA_SE_VOCs	1,2-Dibromoethane	106-93-4	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.00034 UJ	0.00029 UJ	0.00031 UJ	0.00029 U	0.00025 U
RA_SE_VOCs	1,2-Dichloroethane	107-06-2	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	1,2-Dichloropropane	78-87-5	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.00034 UJ	0.00029 UJ	0.00031 UJ	0.00029 U	0.00025 U
RA_SE_VOCs	1,3-Dichloropropane	142-28-9	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.00034 UJ	0.00029 UJ	0.00031 UJ	0.00029 U	0.00025 U
RA_SE_VOCs	2,2-Dichloropropane	594-20-7	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	2-Butanone (MEK)	78-93-3	mg/kg	0.0034 U	0.0029 U	0.0031 U	0.0029 U	0.0025 U
RA_SE_VOCs	2-Chlorotoluene	95-49-8	mg/kg	0.00068 UJ	0.00057 UJ	0.00062 UJ	0.00058 U	0.0005 U
RA_SE_VOCs	2-Hexanone	591-78-6	mg/kg	0.0014 U	0.0011 U	0.0012 U	0.0012 U	0.001 U
RA_SE_VOCs	4-Chlorotoluene	106-43-4	mg/kg	0.00068 UJ	0.00057 UJ	0.00062 UJ	0.00058 U	0.0005 U
RA_SE_VOCs	4-Isopropyltoluene	99-87-6	mg/kg	0.00034 UJ	0.00029 UJ	0.00031 UJ	0.00029 U	0.00025 U
RA_SE_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.0014 U	0.0011 U	0.0012 U	0.0012 U	0.001 U
RA_SE_VOCs	Acetone	67-64-1	mg/kg	0.0034 U	0.0127	0.0074	0.0029 U	0.0025 U
RA_SE_VOCs	Benzene	71-43-2	mg/kg	0.00034 UJ	0.00029 UJ	0.00031 UJ	0.00029 U	0.00025 U
RA_SE_VOCs	Bromobenzene	108-86-1	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	Bromochloromethane	74-97-5	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	Bromodichloromethane	75-27-4	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	Bromoform	75-25-2	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	Bromomethane	74-83-9	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	Carbon Disulfide	75-15-0	mg/kg	0.0028 J	0.0023 J	0.0029 J	0.00058 U	0.00083 J
RA_SE_VOCs	Carbon Tetrachloride	56-23-5	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U
RA_SE_VOCs	Chlorobenzene	108-90-7	mg/kg	0.00034 UJ	0.00029 UJ	0.00031 UJ	0.00029 U	0.00025 U
RA_SE_VOCs	Chloroethane	75-00-3	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	Chloroform	67-66-3	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	Chloromethane	74-87-3	mg/kg	0.0014 U	0.0011 U	0.0012 U	0.0012 U	0.001 U
RA_SE_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U
RA_SE_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U
RA_SE_VOCs	dibromochloromethane	124-48-1	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	Dibromomethane	74-95-3	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	Ethylbenzene	100-41-4	mg/kg	0.00068 UJ	0.00057 UJ	0.00062 UJ	0.00058 U	0.0005 U
RA_SE_VOCs	Hexachlorobutadiene	87-68-3	mg/kg	0.00068 UJ	0.00057 UJ	0.00062 UJ	0.00058 U	0.0005 U
RA_SE_VOCs	Isopropylbenzene	98-82-8	mg/kg	0.00034 UJ	0.00029 UJ	0.00031 UJ	0.00029 U	0.00025 U
RA_SE_VOCs	M,P-Xylenes	179601-23-1	mg/kg	0.00068 UJ	0.00057 UJ	0.00062 UJ	0.00058 U	0.0005 U
RA_SE_VOCs	Methylene Chloride	75-09-2	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U

ATTACHMENT A, TABLE A-5B
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
			Location ID	SED-OFF-7-090115	SED-OFF-8-090115	SED-OFF-9-090115	SED-ON-10-082515	SED-ON-9-082515
			Sample Type Code	N	N	N	N	N
			Sample ID	SED-OFF-7-090115	SED-OFF-8-090115	SED-OFF-9-090115	SED-ON-10-082515	SED-ON-9-082515
			Sample Date	9/1/2015	9/1/2015	9/1/2015	8/25/2015	8/25/2015
			Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units					
RA_SE_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	Naphthalene	91-20-3	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	n-Butylbenzene	104-51-8	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U
RA_SE_VOCs	n-Propylbenzene	103-65-1	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	O-Xylene	95-47-6	mg/kg	0.00034 UJ	0.00029 UJ	0.00031 UJ	0.00029 U	0.00025 U
RA_SE_VOCs	sec-Butylbenzene	135-98-8	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U
RA_SE_VOCs	Styrene	100-42-5	mg/kg	0.00034 UJ	0.00029 UJ	0.00031 UJ	0.00029 U	0.00025 U
RA_SE_VOCs	tert-Butylbenzene	98-06-6	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U
RA_SE_VOCs	Tetrachloroethene	127-18-4	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U
RA_SE_VOCs	Toluene	108-88-3	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U
RA_SE_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.0010 U	0.00086 U	0.00093 U	0.00087 U	0.00075 U
RA_SE_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U
RA_SE_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.00034 U	0.00029 U	0.00031 U	0.00029 U	0.00025 U
RA_SE_VOCs	Trichloroethylene	79-01-6	mg/kg	0.00034 UJ	0.00029 UJ	0.00031 UJ	0.00029 U	0.00025 U
RA_SE_VOCs	Trichlorofluoromethane	75-69-4	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U
RA_SE_VOCs	Vinyl Chloride	75-01-4	mg/kg	0.00068 U	0.00057 U	0.00062 U	0.00058 U	0.0005 U

Notes:
CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
VOC = Volatile organic compound.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location Group				Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location ID				SED 3	SED 3	SED 4	SED 4	SED 5	SED-103-2014	SED-104-2014
Sample Type Code				N	FD	N	FD	N	N	N
Sample ID				SED 3A 0-0.5	SED 3AD 0-0.5	SED-4A 0-0.5	SED-4A 0-0.5DUP	SED-5A 0-0.5	SED-103-A-2014	SED-104-A-2014
Sample Date				11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	8/5/2014	8/5/2014
Depth Interval				0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SE_AVS-SEM	ACID VOLATILE SULFIDE	18496-25-8	UMOL/G							
RA_SE_AVS-SEM	Antimony	7440-36-0	UMOL/G							
RA_SE_AVS-SEM	Cadmium	7440-43-9	UMOL/G							
RA_SE_AVS-SEM	Chromium	7440-47-3	UMOL/G							
RA_SE_AVS-SEM	Copper	7440-50-8	UMOL/G							
RA_SE_AVS-SEM	Lead	7439-92-1	UMOL/G							
RA_SE_AVS-SEM	Mercury	7439-97-6	UMOL/G							
RA_SE_AVS-SEM	Nickel	7440-02-0	UMOL/G							
RA_SE_AVS-SEM	Silver	7440-22-4	UMOL/G							
RA_SE_AVS-SEM	Zinc	7440-66-6	UMOL/G							
RA_SE_Metals	Aluminum	7429-90-5	mg/kg							
RA_SE_Metals	Antimony	7440-36-0	mg/kg							
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	1.4 J	1 J	2.7 J	2.52 J	1.7 U	1.3 J	7.2
RA_SE_Metals	Barium	7440-39-3	mg/kg	16.3	15	6.3	6.14	1.5 J	2.9	24
RA_SE_Metals	Beryllium	7440-41-7	mg/kg							
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.5 U	0.5 U	0.2 J	0.14 J	0.3 U	0.3 U	0.6 U
RA_SE_Metals	Calcium	7440-70-2	mg/kg							
RA_SE_Metals	Chromium	7440-47-3	mg/kg	8.5	6.4	8.1	7.78	2.3	3.9	7.4
RA_SE_Metals	Cobalt	7440-48-4	mg/kg							
RA_SE_Metals	Copper	7440-50-8	mg/kg							
RA_SE_Metals	Iron	7439-89-6	mg/kg							
RA_SE_Metals	Lead	7439-92-1	mg/kg	113	34.3	118	107	4.6	6.2	34.3
RA_SE_Metals	Magnesium	7439-95-4	mg/kg							
RA_SE_Metals	Manganese	7439-96-5	mg/kg							
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.031	0.022 J	0.035 U		0.023 U	0.021 U	0.026 J
RA_SE_Metals	Nickel	7440-02-0	mg/kg							
RA_SE_Metals	Potassium	7440-09-7	mg/kg							
RA_SE_Metals	Selenium	7782-49-2	mg/kg	0.8 J	4.6 U	1 J	0.92 J	3.3 U	3.7 UJ	6.8 UJ
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.5 U	0.5 U	0.6 U	0.6 U	0.3 U	0.3 U	0.6 U
RA_SE_Metals	Sodium	7440-23-5	mg/kg							
RA_SE_Metals	Thallium	7440-28-0	mg/kg							
RA_SE_Metals	Vanadium	7440-62-2	mg/kg							
RA_SE_Metals	Zinc	7440-66-6	mg/kg							
RA_SE_Other	Total Organic Carbon	TOC	mg/kg			33600		3000		
RA_SE_Other	TOTAL SOLIDS	SOLIDS	%							
RA_SE_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.0831 U	0.0769 U	0.0656 U		0.0492 U		
RA_SE_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.0831 U	0.0769 U	0.0656 U		0.0492 U		
RA_SE_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.0831 U	0.0769 U	0.0656 U		0.0492 U		
RA_SE_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.0831 U	0.0769 U	0.0656 U		0.0492 U		
RA_SE_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.0831 U	0.0769 U	0.0656 U		0.0492 U		
RA_SE_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.0831 U	0.0769 U	0.0656 U		0.0492 U		
RA_SE_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.0831 U	0.0769 U	0.104		0.0174 J		
RA_SE_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg	0.0831 U	0.0769 U	0.0656 U		0.0492 U		

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location Group				Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location ID				SED 3	SED 3	SED 4	SED 4	SED 5	SED-103-2014	SED-104-2014
Sample Type Code				N	FD	N	FD	N	N	N
Sample ID				SED 3A 0-0.5	SED 3AD 0-0.5	SED-4A 0-0.5	SED-4A 0-0.5DUP	SED-5A 0-0.5	SED-103-A-2014	SED-104-A-2014
Sample Date				11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	8/5/2014	8/5/2014
Depth Interval				0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SE_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg	0.0831 U	0.0769 U	0.0656 U		0.0492 U		
RA_SE_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg							
RA_SE_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.75 U	0.69 U	0.63		0.41		
RA_SE_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg							
RA_SE_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg							
RA_SE_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg							
RA_SE_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg							
RA_SE_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg							
RA_SE_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg							
RA_SE_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg							
RA_SE_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg							
RA_SE_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg							
RA_SE_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg							
RA_SE_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg							
RA_SE_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg							
RA_SE_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg							
RA_SE_SVOCs	2-Chlorophenol	95-57-8	mg/kg							
RA_SE_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg							
RA_SE_SVOCs	2-Methylphenol	95-48-7	mg/kg							
RA_SE_SVOCs	2-Nitroaniline	88-74-4	mg/kg							
RA_SE_SVOCs	2-Nitrophenol	88-75-5	mg/kg							
RA_SE_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg							
RA_SE_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg							
RA_SE_SVOCs	3-Nitroaniline	99-09-2	mg/kg							
RA_SE_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg							
RA_SE_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg							
RA_SE_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg							
RA_SE_SVOCs	4-Chloroaniline	106-47-8	mg/kg							
RA_SE_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg							
RA_SE_SVOCs	4-Nitroaniline	100-01-6	mg/kg							
RA_SE_SVOCs	4-Nitrophenol	100-02-7	mg/kg							
RA_SE_SVOCs	Acenaphthene	83-32-9	mg/kg							
RA_SE_SVOCs	Acenaphthylene	208-96-8	mg/kg							
RA_SE_SVOCs	Anthracene	120-12-7	mg/kg							
RA_SE_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg							
RA_SE_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg							
RA_SE_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg							
RA_SE_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg							
RA_SE_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg							
RA_SE_SVOCs	Benzoic acid	65-85-0	mg/kg							
RA_SE_SVOCs	Benzyl Alcohol	100-51-6	mg/kg							
RA_SE_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg							
RA_SE_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg							

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED 3	SED 3	SED 4	SED 4	SED 5	SED-103-2014	SED-104-2014
				Sample Type Code	N	FD	N	FD	N	N	N
				Sample ID	SED 3A 0-0.5	SED 3AD 0-0.5	SED-4A 0-0.5	SED-4A 0-0.5DUP	SED-5A 0-0.5	SED-103-A-2014	SED-104-A-2014
				Sample Date	11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	8/5/2014	8/5/2014
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg								
RA_SE_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg								
RA_SE_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg								
RA_SE_SVOCs	Carbazole	86-74-8	mg/kg								
RA_SE_SVOCs	Chrysene	218-01-9	mg/kg								
RA_SE_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg								
RA_SE_SVOCs	Dibenzofuran	132-64-9	mg/kg								
RA_SE_SVOCs	Diethyl Phthalate	84-66-2	mg/kg								
RA_SE_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg								
RA_SE_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg								
RA_SE_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg								
RA_SE_SVOCs	Fluoranthene	206-44-0	mg/kg								
RA_SE_SVOCs	Fluorene	86-73-7	mg/kg								
RA_SE_SVOCs	Hexachlorobenzene	118-74-1	mg/kg								
RA_SE_SVOCs	Hexachloroethane	67-72-1	mg/kg								
RA_SE_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg								
RA_SE_SVOCs	Isophorone	78-59-1	mg/kg								
RA_SE_SVOCs	Naphthalene	91-20-3	mg/kg								
RA_SE_SVOCs	Nitrobenzene	98-95-3	mg/kg								
RA_SE_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg								
RA_SE_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg								
RA_SE_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg								
RA_SE_SVOCs	Pentachlorophenol	87-86-5	mg/kg								
RA_SE_SVOCs	Phenanthrene	85-01-8	mg/kg								
RA_SE_SVOCs	Phenol	108-95-2	mg/kg								
RA_SE_SVOCs	Pyrene	129-00-0	mg/kg								
RA_SE_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg								
RA_SE_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg								
RA_SE_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg								
RA_SE_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	
RA_SE_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	
RA_SE_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.0025 U	0.005 U	
RA_SE_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	
RA_SE_VOCs	1,1-Dichloroethane	75-34-3	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	
RA_SE_VOCs	1,1-Dichloroethene	75-35-4	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	
RA_SE_VOCs	1,1-Dichloropropene	563-58-6	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	
RA_SE_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	
RA_SE_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	
RA_SE_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	
RA_SE_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	
RA_SE_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	
RA_SE_VOCs	1,2-Dibromoethane	106-93-4	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	
RA_SE_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U	

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED 3	SED 3	SED 4	SED 4	SED 5	SED-103-2014	SED-104-2014
				Sample Type Code	N	FD	N	FD	N	N	N
				Sample ID	SED 3A 0-0.5	SED 3AD 0-0.5	SED-4A 0-0.5	SED-4A 0-0.5DUP	SED-5A 0-0.5	SED-103-A-2014	SED-104-A-2014
				Sample Date	11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	8/5/2014	8/5/2014
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_VOCs	1,2-Dichloroethane	107-06-2	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	1,2-Dichloropropane	78-87-5	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	1,3-Dichloropropane	142-28-9	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	2,2-Dichloropropane	594-20-7	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	2-Butanone (MEK)	78-93-3	mg/kg	0.0323 J	0.024 J	0.0083 J		0.0319 U	0.0175 J	0.0422 J
RA_SE_VOCs	2-Chlorotoluene	95-49-8	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	2-Hexanone	591-78-6	mg/kg	0.0524 U	0.0485 U	0.0758 U		0.0319 U	0.0126 U	0.0248 U
RA_SE_VOCs	4-Chlorotoluene	106-43-4	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	4-Isopropyltoluene	99-87-6	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.0524 U	0.0485 U	0.0758 U		0.0319 U	0.0126 U	0.0248 U
RA_SE_VOCs	Acetone	67-64-1	mg/kg	0.0524 U	0.0485 U	0.158		0.0319 U	0.12	0.283
RA_SE_VOCs	Benzene	71-43-2	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Bromobenzene	108-86-1	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Bromochloromethane	74-97-5	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Bromodichloromethane	75-27-4	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Bromoform	75-25-2	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Bromomethane	74-83-9	mg/kg	0.0105 U	0.0097 U	0.0152 U		0.0064 U	0.005 U	0.0099 U
RA_SE_VOCs	Carbon Disulfide	75-15-0	mg/kg	0.0052 U	0.0048 U	0.0134		0.0032 U	0.005 U	0.0042 J
RA_SE_VOCs	Carbon Tetrachloride	56-23-5	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Chlorobenzene	108-90-7	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Chloroethane	75-00-3	mg/kg	0.0105 U	0.0097 U	0.0152 U		0.0064 U	0.005 U	0.0099 U
RA_SE_VOCs	Chloroform	67-66-3	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Chloromethane	74-87-3	mg/kg	0.0105 U	0.0097 U	0.0152 U		0.0064 U	0.005 U	0.0099 U
RA_SE_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	dibromochloromethane	124-48-1	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.0025 U	0.005 U
RA_SE_VOCs	Dibromomethane	74-95-3	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0105 U	0.0097 U	0.0152 U		0.0064 U	0.005 U	0.0099 U
RA_SE_VOCs	Ethylbenzene	100-41-4	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Hexachlorobutadiene	87-68-3	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Isopropylbenzene	98-82-8	mg/kg	0.0038 J	0.0021 J	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	M,P-Xylenes	179601-23-1	mg/kg	0.0105 U	0.0097 U	0.0152 U		0.0064 U	0.0101 U	0.0198 U
RA_SE_VOCs	Methylene Chloride	75-09-2	mg/kg	0.0262 U	0.0242 U	0.0379 U		0.0159 U	0.005 U	0.0099 U
RA_SE_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Naphthalene	91-20-3	mg/kg	0.0038 J	0.0026 J	7.6 U		3.2 U	0.005 U	0.0164
RA_SE_VOCs	n-Butylbenzene	104-51-8	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	n-Propylbenzene	103-65-1	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	O-Xylene	95-47-6	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	sec-Butylbenzene	135-98-8	mg/kg	0.0106	0.0069	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Styrene	100-42-5	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED 3	SED 3	SED 4	SED 4	SED 5	SED-103-2014	SED-104-2014
				Sample Type Code	N	FD	N	FD	N	N	N
				Sample ID	SED 3A 0-0.5	SED 3AD 0-0.5	SED-4A 0-0.5	SED-4A 0-0.5DUP	SED-5A 0-0.5	SED-103-A-2014	SED-104-A-2014
				Sample Date	11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	8/5/2014	8/5/2014
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_VOCs	tert-Butylbenzene	98-06-6	mg/kg	0.0065	0.0038 J	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Tetrachloroethene	127-18-4	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Toluene	108-88-3	mg/kg	0.0052 U	0.0048 U	0.004 J		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.016 U	0.015 U	0.023 U		0.0096 U	0.015 U	0.030 U
RA_SE_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Trichloroethylene	79-01-6	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Trichlorofluoromethane	75-69-4	mg/kg	0.0052 U	0.0048 U	0.0076 U		0.0032 U	0.005 U	0.0099 U
RA_SE_VOCs	Vinyl Chloride	75-01-4	mg/kg	0.0105 U	0.0097 U	0.0152 U		0.0064 U	0.005 U	0.0099 U

Notes:
% = Percent.
AVS-SEM = Acid volatile sulfide and simultaneoulsy extracted metals.
CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
UMOL/G = Micromole per gram.
VOC = Volatile organic compound.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED-105-2014	SED-326	SED-327	SED-328	SED-329	SED-330	SED-331
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SED-105-A-2014	SED-326-CI19-0-0.5	SED-327-CI19-0-0.5	SED-328-CI19-0-0.5	SED-329-CI19-0-0.5	SED-330-CI19-0-0.5	SED-331-CI19-0-0.5
				Sample Date	8/5/2014	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/2/2019
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_AVS-SEM	ACID VOLATILE SULFIDE	18496-25-8	UMOL/G								
RA_SE_AVS-SEM	Antimony	7440-36-0	UMOL/G								
RA_SE_AVS-SEM	Cadmium	7440-43-9	UMOL/G								
RA_SE_AVS-SEM	Chromium	7440-47-3	UMOL/G								
RA_SE_AVS-SEM	Copper	7440-50-8	UMOL/G								
RA_SE_AVS-SEM	Lead	7439-92-1	UMOL/G								
RA_SE_AVS-SEM	Mercury	7439-97-6	UMOL/G								
RA_SE_AVS-SEM	Nickel	7440-02-0	UMOL/G								
RA_SE_AVS-SEM	Silver	7440-22-4	UMOL/G								
RA_SE_AVS-SEM	Zinc	7440-66-6	UMOL/G								
RA_SE_Metals	Aluminum	7429-90-5	mg/kg		5240	5580	6440	7980	5060	6020	
RA_SE_Metals	Antimony	7440-36-0	mg/kg		0.0950	0.0740 J	0.162	0.140	0.0610 J	1.10	
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	4.8	2.42	2.14	2.86	3.69	1.53	15.9	
RA_SE_Metals	Barium	7440-39-3	mg/kg	15.6	15.6	13.4	22.4	17.3	12.7	87.5	
RA_SE_Metals	Beryllium	7440-41-7	mg/kg		0.417	0.376	0.498	0.519	0.515	0.787	
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.5 U	0.0830 J	0.0692 J	0.150	0.135	0.0563 J	0.964	
RA_SE_Metals	Calcium	7440-70-2	mg/kg		655	464	1040	700	668	6670	
RA_SE_Metals	Chromium	7440-47-3	mg/kg	9.9	6.74	6.94	8.21	9.77	5.44	10.4	
RA_SE_Metals	Cobalt	7440-48-4	mg/kg		2.26	2.37	4.06	4.33	2.48	21.8	
RA_SE_Metals	Copper	7440-50-8	mg/kg		8.34	6.54	13.4	11.2	6.12	36.7	
RA_SE_Metals	Iron	7439-89-6	mg/kg		8900	8040	11300	20100	9210	123000	
RA_SE_Metals	Lead	7439-92-1	mg/kg	34.4	17.9	20.2	31.5	30.0	11.9	42.0	
RA_SE_Metals	Magnesium	7439-95-4	mg/kg		1170	1180	1620	2200	1330	974	
RA_SE_Metals	Manganese	7439-96-5	mg/kg		76.1	67.8	170	118	90.0	1500	
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.044	0.0240 J	0.0140 J	0.0410	0.0440	0.0150 J	0.210 J	
RA_SE_Metals	Nickel	7440-02-0	mg/kg		5.00	4.90	6.10	9.17	4.73	16.1	
RA_SE_Metals	Potassium	7440-09-7	mg/kg		346	321	623	363	450	458 J	
RA_SE_Metals	Selenium	7782-49-2	mg/kg	6 UJ	0.160 J	0.150 J	0.393	0.320 J	0.140 J	1.50 J	
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.5 U	0.0350 J	0.0330 J	0.0670	0.0520 J	0.0340 J	0.230 J	
RA_SE_Metals	Sodium	7440-23-5	mg/kg		38 U	31 U	26 U	34 U	28 U	345 J	
RA_SE_Metals	Thallium	7440-28-0	mg/kg		0.0720 J	0.0670 J	0.103	0.0904	0.0756	0.240 J	
RA_SE_Metals	Vanadium	7440-62-2	mg/kg		9.54	8.93	12.6	14.7	8.07	23.3	
RA_SE_Metals	Zinc	7440-66-6	mg/kg		61.1	45.3	84.5	112	48.7	294	
RA_SE_Other	Total Organic Carbon	TOC	mg/kg			18000 J		33000 J		440000 J	
RA_SE_Other	TOTAL SOLIDS	SOLIDS	%								
RA_SE_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg		0.01 U	0.0092 U	0.054 U	0.012 U	0.01 U	0.068 UJ	
RA_SE_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg		0.01 U	0.0092 U	0.054 U	0.012 U	0.01 U	0.068 UJ	
RA_SE_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg		0.012 U	0.011 U	0.063 U	0.015 U	0.012 U	0.08 UJ	
RA_SE_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg		0.01 U	0.0092 U	0.054 U	0.012 U	0.01 U	0.068 UJ	
RA_SE_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg		0.01 U	0.0092 U	0.054 U	0.012 U	0.01 U	0.068 UJ	
RA_SE_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg		0.01 U	0.0092 U	0.054 U	0.012 U	0.01 U	0.068 UJ	
RA_SE_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg		0.01 U	0.0092 U	0.054 U	0.012 U	0.0220	0.068 UJ	
RA_SE_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg								

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED-105-2014	SED-326	SED-327	SED-328	SED-329	SED-330	SED-331
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SED-105-A-2014	SED-326-CI19-0-0.5	SED-327-CI19-0-0.5	SED-328-CI19-0-0.5	SED-329-CI19-0-0.5	SED-330-CI19-0-0.5	SED-331-CI19-0-0.5
				Sample Date	8/5/2014	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/2/2019
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg								
RA_SE_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg		0.073 U	0.066 U	0.38 U	0.09 U	0.0220 J	0.49 UJ	
RA_SE_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg		0.072 U	0.066 U	0.39 U	0.087 U	0.084	0.49 U	
RA_SE_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg		0.00220 J	0.00200 J	0.00780 J	0.00680 J	0.012 U	0.0230 J	
RA_SE_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg		0.78 U	0.73 U	0.7 U	0.82 U	0.75 U	47 U	
RA_SE_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg		0.78 U	0.73 U	0.7 U	0.82 U	0.75 U	47 U	
RA_SE_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg		0.31 UJ	0.29 UJ	0.28 UJ	0.33 UJ	0.3 UJ	19 UJ	
RA_SE_SVOCs	2-Chlorophenol	95-57-8	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg		0.013 U	0.00730 J	0.00960 J	0.00580 J	0.012 U	0.0270 J	
RA_SE_SVOCs	2-Methylphenol	95-48-7	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	2-Nitroaniline	88-74-4	mg/kg		0.78 U	0.73 U	0.7 U	0.82 U	0.75 U	47 U	
RA_SE_SVOCs	2-Nitrophenol	88-75-5	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg		0.31 UJ	0.29 UJ	0.28 UJ	0.33 UJ	0.3 UJ	19 UJ	
RA_SE_SVOCs	3-Nitroaniline	99-09-2	mg/kg		0.78 U	0.73 U	0.7 U	0.82 U	0.75 U	47 U	
RA_SE_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg		0.78 U	0.73 U	0.7 U	0.82 U	0.75 U	47 U	
RA_SE_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	4-Chloroaniline	106-47-8	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	4-Nitroaniline	100-01-6	mg/kg		0.78 U	0.73 U	0.7 U	0.82 U	0.75 U	47 U	
RA_SE_SVOCs	4-Nitrophenol	100-02-7	mg/kg		0.78 U	0.73 U	0.7 U	0.82 U	0.75 U	47 U	
RA_SE_SVOCs	Acenaphthene	83-32-9	mg/kg		0.013 U	0.00560 J	0.0150 J	0.013 U	0.012 U	0.076 U	
RA_SE_SVOCs	Acenaphthylene	208-96-8	mg/kg		0.013 U	0.0200 J	0.00620 J	0.013 U	0.012 U	0.076 U	
RA_SE_SVOCs	Anthracene	120-12-7	mg/kg		0.0310 J	0.35 J	0.0520 J	0.00730 J	0.00530 J	0.0330 J	
RA_SE_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg		0.57	0.7	0.79	0.0820	0.0770	0.37	
RA_SE_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg		1 J	0.77 J	1.7 J	0.14 J	0.17 J	0.81 J	
RA_SE_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg		1.9	1.2	3.6	0.27	0.39	1.4	
RA_SE_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg		0.87	0.45	2	0.13	0.15	0.59	
RA_SE_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg		0.6	0.38	1.2	0.0810	0.11	0.41	
RA_SE_SVOCs	Benzoic acid	65-85-0	mg/kg		0.78 UJ	0.73 UJ	0.7 UJ	0.82 UJ	0.75 UJ	47 UJ	
RA_SE_SVOCs	Benzyl Alcohol	100-51-6	mg/kg		0.62 U	0.59 U	0.56 U	0.66 U	0.6 U	38 U	
RA_SE_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	
RA_SE_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U	

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location Group				Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location ID				SED-105-2014	SED-326	SED-327	SED-328	SED-329	SED-330	SED-331
Sample Type Code				N	N	N	N	N	N	N
Sample ID				SED-105-A-2014	SED-326-CI19-0-0.5	SED-327-CI19-0-0.5	SED-328-CI19-0-0.5	SED-329-CI19-0-0.5	SED-330-CI19-0-0.5	SED-331-CI19-0-0.5
Sample Date				8/5/2014	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/2/2019
Depth Interval				0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SE_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg		0.31 U	0.29 U	0.16 J	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Carbazole	86-74-8	mg/kg		0.31 U	0.29 U	0.22 J	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Chrysene	218-01-9	mg/kg		1.2	0.99	2.2	0.18	0.2	0.82
RA_SE_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg		0.18	0.14	0.38	0.0260 J	0.0380	0.14 J
RA_SE_SVOCs	Dibenzofuran	132-64-9	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Diethyl Phthalate	84-66-2	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Fluoranthene	206-44-0	mg/kg		2	1.8	3.4	0.23	0.27	1.1
RA_SE_SVOCs	Fluorene	86-73-7	mg/kg		0.0100 J	0.0420	0.0200 J	0.00470 J	0.012 U	0.0430 J
RA_SE_SVOCs	Hexachlorobenzene	118-74-1	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Hexachloroethane	67-72-1	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg		1.4	0.85	3.2	0.19	0.22	0.7
RA_SE_SVOCs	Isophorone	78-59-1	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Naphthalene	91-20-3	mg/kg		0.00790 J	0.0130 J	0.0220 J	0.013 U	0.012 U	0.076 U
RA_SE_SVOCs	Nitrobenzene	98-95-3	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Pentachlorophenol	87-86-5	mg/kg		0.78 U	0.73 U	0.7 U	0.82 U	0.75 U	47 U
RA_SE_SVOCs	Phenanthrene	85-01-8	mg/kg		0.49	0.68	0.9	0.1	0.0900	0.53
RA_SE_SVOCs	Phenol	108-95-2	mg/kg		0.31 U	0.29 U	0.28 U	0.33 U	0.3 U	19 U
RA_SE_SVOCs	Pyrene	129-00-0	mg/kg		1.7 J	1.5 J	2.1 J	0.23 J	0.24 J	2.1 J
RA_SE_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg		11	8.8	21	1.6	1.9	8.4
RA_SE_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg		0.56	1.1	1.0	0.14	0.13	0.75
RA_SE_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg		12	9.9	22	1.7	2.0	9.2
RA_SE_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0038 U						
RA_SE_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0038 U						
RA_SE_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0019 U						
RA_SE_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0038 U						
RA_SE_VOCs	1,1-Dichloroethane	75-34-3	mg/kg	0.0038 U						
RA_SE_VOCs	1,1-Dichloroethene	75-35-4	mg/kg	0.0038 U						
RA_SE_VOCs	1,1-Dichloropropene	563-58-6	mg/kg	0.0038 U						
RA_SE_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0038 U						
RA_SE_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0038 U						
RA_SE_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0038 U						
RA_SE_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0038 U						
RA_SE_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0038 U						
RA_SE_VOCs	1,2-Dibromoethane	106-93-4	mg/kg	0.0038 U						
RA_SE_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0038 U						

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED-105-2014	SED-326	SED-327	SED-328	SED-329	SED-330	SED-331
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SED-105-A-2014	SED-326-CI19-0-0.5	SED-327-CI19-0-0.5	SED-328-CI19-0-0.5	SED-329-CI19-0-0.5	SED-330-CI19-0-0.5	SED-331-CI19-0-0.5
				Sample Date	8/5/2014	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/2/2019
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_VOCs	1,2-Dichloroethane	107-06-2	mg/kg	0.0038 U							
RA_SE_VOCs	1,2-Dichloropropane	78-87-5	mg/kg	0.0038 U							
RA_SE_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0038 U							
RA_SE_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0038 U							
RA_SE_VOCs	1,3-Dichloropropane	142-28-9	mg/kg	0.0038 U							
RA_SE_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0038 U							
RA_SE_VOCs	2,2-Dichloropropane	594-20-7	mg/kg	0.0038 U							
RA_SE_VOCs	2-Butanone (MEK)	78-93-3	mg/kg	0.0096 J							
RA_SE_VOCs	2-Chlorotoluene	95-49-8	mg/kg	0.0038 U							
RA_SE_VOCs	2-Hexanone	591-78-6	mg/kg	0.0095 U							
RA_SE_VOCs	4-Chlorotoluene	106-43-4	mg/kg	0.0038 U							
RA_SE_VOCs	4-Isopropyltoluene	99-87-6	mg/kg	0.0038 U							
RA_SE_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.0095 U							
RA_SE_VOCs	Acetone	67-64-1	mg/kg	0.061							
RA_SE_VOCs	Benzene	71-43-2	mg/kg	0.0038 U							
RA_SE_VOCs	Bromobenzene	108-86-1	mg/kg	0.0038 U							
RA_SE_VOCs	Bromochloromethane	74-97-5	mg/kg	0.0038 U							
RA_SE_VOCs	Bromodichloromethane	75-27-4	mg/kg	0.0038 U							
RA_SE_VOCs	Bromoform	75-25-2	mg/kg	0.0038 U							
RA_SE_VOCs	Bromomethane	74-83-9	mg/kg	0.0038 U							
RA_SE_VOCs	Carbon Disulfide	75-15-0	mg/kg	0.0028 J							
RA_SE_VOCs	Carbon Tetrachloride	56-23-5	mg/kg	0.0038 U							
RA_SE_VOCs	Chlorobenzene	108-90-7	mg/kg	0.0038 U							
RA_SE_VOCs	Chloroethane	75-00-3	mg/kg	0.0038 U							
RA_SE_VOCs	Chloroform	67-66-3	mg/kg	0.0038 U							
RA_SE_VOCs	Chloromethane	74-87-3	mg/kg	0.0038 U							
RA_SE_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0038 U							
RA_SE_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0038 U							
RA_SE_VOCs	dibromochloromethane	124-48-1	mg/kg	0.0019 U							
RA_SE_VOCs	Dibromomethane	74-95-3	mg/kg	0.0038 U							
RA_SE_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0038 U							
RA_SE_VOCs	Ethylbenzene	100-41-4	mg/kg	0.0038 U							
RA_SE_VOCs	Hexachlorobutadiene	87-68-3	mg/kg	0.0038 U							
RA_SE_VOCs	Isopropylbenzene	98-82-8	mg/kg	0.0038 U							
RA_SE_VOCs	M,P-Xylenes	179601-23-1	mg/kg	0.0076 U							
RA_SE_VOCs	Methylene Chloride	75-09-2	mg/kg	0.0038 U							
RA_SE_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0038 U							
RA_SE_VOCs	Naphthalene	91-20-3	mg/kg	0.0013 J							
RA_SE_VOCs	n-Butylbenzene	104-51-8	mg/kg	0.0038 U							
RA_SE_VOCs	n-Propylbenzene	103-65-1	mg/kg	0.0038 U							
RA_SE_VOCs	O-Xylene	95-47-6	mg/kg	0.0038 U							
RA_SE_VOCs	sec-Butylbenzene	135-98-8	mg/kg	0.0038 U							
RA_SE_VOCs	Styrene	100-42-5	mg/kg	0.0038 U							

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location Group				Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
Location ID				SED-105-2014	SED-326	SED-327	SED-328	SED-329	SED-330	SED-331
Sample Type Code				N	N	N	N	N	N	N
Sample ID				SED-105-A-2014	SED-326-CI19-0-0.5	SED-327-CI19-0-0.5	SED-328-CI19-0-0.5	SED-329-CI19-0-0.5	SED-330-CI19-0-0.5	SED-331-CI19-0-0.5
Sample Date				8/5/2014	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/1/2019	10/2/2019
Depth Interval				0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SE_VOCs	tert-Butylbenzene	98-06-6	mg/kg	0.0038 U						
RA_SE_VOCs	Tetrachloroethene	127-18-4	mg/kg	0.0038 U						
RA_SE_VOCs	Toluene	108-88-3	mg/kg	0.0038 U						
RA_SE_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.011 U						
RA_SE_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0038 U						
RA_SE_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0038 U						
RA_SE_VOCs	Trichloroethylene	79-01-6	mg/kg	0.0038 U						
RA_SE_VOCs	Trichlorofluoromethane	75-69-4	mg/kg	0.0038 U						
RA_SE_VOCs	Vinyl Chloride	75-01-4	mg/kg	0.0038 U						

Notes:
% = Percent.
AVS-SEM = Acid volatile sulfide and simultaneoulsy extracted metals.
CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
UMOL/G = Micromole per gram.
VOC = Volatile organic compound.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED-331	SED-332	SED-333	SED-333	SED-334	SED-335	SED-335
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SED-331-CI20-0-0.5	SED-332-CI19-0-0.5	SED-333-CI19-0-0.5	SED-333-CI20-0-0.5	SED-334-CI19-0-0.5	SED-335-CI19-0-0.5	SED-335-CI20-0-0.5
				Sample Date	5/28/2020	10/2/2019	10/2/2019	5/28/2020	10/2/2019	10/2/2019	5/28/2020
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_AVS-SEM	ACID VOLATILE SULFIDE	18496-25-8	UMOL/G	0.097 U			1.8			3.2
RA_SE_AVS-SEM	Antimony	7440-36-0	UMOL/G	0.0011 U			0.0047 U			0.0033 U
RA_SE_AVS-SEM	Cadmium	7440-43-9	UMOL/G	0.000124 J			0.00189 J			0.000938 J
RA_SE_AVS-SEM	Chromium	7440-47-3	UMOL/G	0.00382 J			0.200			0.0601
RA_SE_AVS-SEM	Copper	7440-50-8	UMOL/G	0.00856 J			0.288			0.0689
RA_SE_AVS-SEM	Lead	7439-92-1	UMOL/G	0.0151			0.678			0.260
RA_SE_AVS-SEM	Mercury	7439-97-6	UMOL/G	0.000010 JB			0.0000241 JB			0.000041 UB
RA_SE_AVS-SEM	Nickel	7440-02-0	UMOL/G	0.00372 J			0.136			0.0414
RA_SE_AVS-SEM	Silver	7440-22-4	UMOL/G	0.0010 U			0.00323 J			0.00066 J
RA_SE_AVS-SEM	Zinc	7440-66-6	UMOL/G	0.0659			1.18			0.404
RA_SE_Metals	Aluminum	7429-90-5	mg/kg		14100	20500		17100	16900	
RA_SE_Metals	Antimony	7440-36-0	mg/kg		0.560 J	0.200		0.360 J	0.898	
RA_SE_Metals	Arsenic	7440-38-2	mg/kg		14.4	11.1		11.2	26.4	
RA_SE_Metals	Barium	7440-39-3	mg/kg		120	32.7		43.6	34.6	
RA_SE_Metals	Beryllium	7440-41-7	mg/kg		1.65	1.18		0.951	1.48	
RA_SE_Metals	Cadmium	7440-43-9	mg/kg		2.90	0.590		0.191 J	0.892	
RA_SE_Metals	Calcium	7440-70-2	mg/kg		5950	1710		2540	3470	
RA_SE_Metals	Chromium	7440-47-3	mg/kg		22.4	22.8		27.7	44.4	
RA_SE_Metals	Cobalt	7440-48-4	mg/kg		31.0	8.14		9.31	10.0	
RA_SE_Metals	Copper	7440-50-8	mg/kg		50.6	21.5		32.3	75.3	
RA_SE_Metals	Iron	7439-89-6	mg/kg		92500	24800		36600	30600	
RA_SE_Metals	Lead	7439-92-1	mg/kg		82.4	116		184	584	
RA_SE_Metals	Magnesium	7439-95-4	mg/kg		3120	3910		4480	6960	
RA_SE_Metals	Manganese	7439-96-5	mg/kg		2410	338		621	220	
RA_SE_Metals	Mercury	7439-97-6	mg/kg		0.150 J	0.0919		0.150	0.289	
RA_SE_Metals	Nickel	7440-02-0	mg/kg		25.0	15.1		15.3	33.2	
RA_SE_Metals	Potassium	7440-09-7	mg/kg		1210	1130		1630	2900	
RA_SE_Metals	Selenium	7782-49-2	mg/kg		6.19	0.792 J		1.12	1.31 J	
RA_SE_Metals	Silver	7440-22-4	mg/kg		0.280 J	0.169 J		0.238	0.837	
RA_SE_Metals	Sodium	7440-23-5	mg/kg		798	1610		5620	16800	
RA_SE_Metals	Thallium	7440-28-0	mg/kg		0.450 J	0.263		0.220	0.260 J	
RA_SE_Metals	Vanadium	7440-62-2	mg/kg		24.6	31.6		48.1	70.5	
RA_SE_Metals	Zinc	7440-66-6	mg/kg		330	118		103 J	253	
RA_SE_Other	Total Organic Carbon	TOC	mg/kg			68000 J			190000 J	
RA_SE_Other	TOTAL SOLIDS	SOLIDS	%	78			19			29
RA_SE_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg		0.072 U	0.022 U		0.032 U	0.037 U	
RA_SE_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg		0.072 U	0.022 U		0.032 U	0.037 U	
RA_SE_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg		0.084 U	0.026 U		0.038 U	0.043 U	
RA_SE_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg		0.072 U	0.022 U		0.032 U	0.037 U	
RA_SE_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg		0.072 U	0.022 U		0.032 U	0.037 U	
RA_SE_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg		0.072 U	0.022 U		0.032 U	0.037 U	
RA_SE_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg		0.072 U	0.022 U		0.17	1.3	
RA_SE_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg							

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED-331	SED-332	SED-333	SED-333	SED-334	SED-335	SED-335
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SED-331-CI20-0-0.5	SED-332-CI19-0-0.5	SED-333-CI19-0-0.5	SED-333-CI20-0-0.5	SED-334-CI19-0-0.5	SED-335-CI19-0-0.5	SED-335-CI20-0-0.5
				Sample Date	5/28/2020	10/2/2019	10/2/2019	5/28/2020	10/2/2019	10/2/2019	5/28/2020
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg								
RA_SE_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg		0.51 U	0.16 U		0.17 J	1.3		
RA_SE_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg		0.52 U	0.16 U		0.37	1.5		
RA_SE_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg		0.085 U	0.00440 J		0.2	0.18		
RA_SE_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg		5.2 U	1.3 U		2.1 U	2.5 U		
RA_SE_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg		2.1 U	0.53 U		0.85 U	1 U		
RA_SE_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg		2.1 U	0.53 U		0.85 U	1 U		
RA_SE_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg		2.1 U	0.53 U		0.85 U	1 U		
RA_SE_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg		5.2 U	1.3 U		2.1 U	2.5 U		
RA_SE_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg		2.1 UJ	0.53 UJ		0.85 UJ	1 UJ		
RA_SE_SVOCs	2-Chlorophenol	95-57-8	mg/kg		2.1 U	0.53 U		0.85 U	1 U		
RA_SE_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg		0.085 U	0.00480 J		0.23	0.24		
RA_SE_SVOCs	2-Methylphenol	95-48-7	mg/kg		2.1 U	0.53 U		0.85 U	1 U		
RA_SE_SVOCs	2-Nitroaniline	88-74-4	mg/kg		5.2 U	1.3 UJ		2.1 U	2.5 UJ		
RA_SE_SVOCs	2-Nitrophenol	88-75-5	mg/kg		2.1 U	0.53 U		0.85 U	1 U		
RA_SE_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg		2.1 U	0.53 U		0.85 U	1 U		
RA_SE_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg		2.1 UJ	0.53 UJ		0.85 UJ	1 UJ		
RA_SE_SVOCs	3-Nitroaniline	99-09-2	mg/kg		5.2 U	1.3 UJ		2.1 U	2.5 UJ		
RA_SE_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg		5.2 U	1.3 U		2.1 U	2.5 U		
RA_SE_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg		2.1 U	0.53 U		0.85 U	1 U		
RA_SE_SVOCs	4-Chloroaniline	106-47-8	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	4-Nitroaniline	100-01-6	mg/kg		5.2 U	1.3 UJ		2.1 U	2.5 UJ		
RA_SE_SVOCs	4-Nitrophenol	100-02-7	mg/kg		5.2 U	1.3 U		2.1 U	2.5 U		
RA_SE_SVOCs	Acenaphthene	83-32-9	mg/kg		0.085 U	0.021 U		0.0270 J	0.04 U		
RA_SE_SVOCs	Acenaphthylene	208-96-8	mg/kg		0.085 U	0.021 U		0.0310 J	0.0460 J		
RA_SE_SVOCs	Anthracene	120-12-7	mg/kg		0.0180 J	0.00470 J		0.0800 J	0.0930 J		
RA_SE_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg		0.23	0.0470		0.54	0.79		
RA_SE_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg		0.45 J	0.0700 J		0.92 J	1.3 J		
RA_SE_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg		0.85	0.11		1.1	1.4		
RA_SE_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg		0.27	0.0460		0.6	0.8		
RA_SE_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg		0.25	0.0400 J		0.35	0.39		
RA_SE_SVOCs	Benzoic acid	65-85-0	mg/kg		5.2 UJ	1.3 UJ		2.1 UJ	2.5 UJ		
RA_SE_SVOCs	Benzyl Alcohol	100-51-6	mg/kg		4.2 U	1 UJ		1.7 U	2 UJ		
RA_SE_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED-331	SED-332	SED-333	SED-333	SED-334	SED-335	SED-335
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SED-331-CI20-0-0.5	SED-332-CI19-0-0.5	SED-333-CI19-0-0.5	SED-333-CI20-0-0.5	SED-334-CI19-0-0.5	SED-335-CI19-0-0.5	SED-335-CI20-0-0.5
				Sample Date	5/28/2020	10/2/2019	10/2/2019	5/28/2020	10/2/2019	10/2/2019	5/28/2020
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg		2.1 U	0.53 UJ		0.85 U	2.2 J		
RA_SE_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Carbazole	86-74-8	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Chrysene	218-01-9	mg/kg		0.47	0.0820		1	1.3		
RA_SE_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg		0.0840 J	0.0140 J		0.17	0.24		
RA_SE_SVOCs	Dibenzofuran	132-64-9	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Diethyl Phthalate	84-66-2	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Fluoranthene	206-44-0	mg/kg		0.69	0.12		0.88	1		
RA_SE_SVOCs	Fluorene	86-73-7	mg/kg		0.085 U	0.021 U		0.12	0.23		
RA_SE_SVOCs	Hexachlorobenzene	118-74-1	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Hexachloroethane	67-72-1	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg		0.32	0.0720		0.5	0.74		
RA_SE_SVOCs	Isophorone	78-59-1	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Naphthalene	91-20-3	mg/kg		0.085 U	0.021 U		0.36	0.37		
RA_SE_SVOCs	Nitrobenzene	98-95-3	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg		2.1 U	0.53 UJ		0.85 U	1 UJ		
RA_SE_SVOCs	Pentachlorophenol	87-86-5	mg/kg		5.2 U	1.3 U		2.1 U	2.5 U		
RA_SE_SVOCs	Phenanthrene	85-01-8	mg/kg		0.29	0.0700		1.3	1.9		
RA_SE_SVOCs	Phenol	108-95-2	mg/kg		2.1 U	0.53 U		0.85 U	1 U		
RA_SE_SVOCs	Pyrene	129-00-0	mg/kg		0.7 J	0.12 J		1.7 J	2.1 J		
RA_SE_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg		4.3	0.72		7.8	10		
RA_SE_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg		0.42	0.10		2.3	3.1		
RA_SE_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg		4.9	0.83		10	13		
RA_SE_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg								
RA_SE_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg								
RA_SE_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg								
RA_SE_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg								
RA_SE_VOCs	1,1-Dichloroethane	75-34-3	mg/kg								
RA_SE_VOCs	1,1-Dichloroethene	75-35-4	mg/kg								
RA_SE_VOCs	1,1-Dichloropropene	563-58-6	mg/kg								
RA_SE_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg								
RA_SE_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg								
RA_SE_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg								
RA_SE_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg								
RA_SE_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg								
RA_SE_VOCs	1,2-Dibromoethane	106-93-4	mg/kg								
RA_SE_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg								

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED-331	SED-332	SED-333	SED-333	SED-334	SED-335	SED-335
				Sample Type Code	N	N	N	N	N	N	N
				Sample ID	SED-331-CI20-0-0.5	SED-332-CI19-0-0.5	SED-333-CI19-0-0.5	SED-333-CI20-0-0.5	SED-334-CI19-0-0.5	SED-335-CI19-0-0.5	SED-335-CI20-0-0.5
				Sample Date	5/28/2020	10/2/2019	10/2/2019	5/28/2020	10/2/2019	10/2/2019	5/28/2020
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_VOCs	1,2-Dichloroethane	107-06-2	mg/kg								
RA_SE_VOCs	1,2-Dichloropropane	78-87-5	mg/kg								
RA_SE_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg								
RA_SE_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA_SE_VOCs	1,3-Dichloropropane	142-28-9	mg/kg								
RA_SE_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA_SE_VOCs	2,2-Dichloropropane	594-20-7	mg/kg								
RA_SE_VOCs	2-Butanone (MEK)	78-93-3	mg/kg								
RA_SE_VOCs	2-Chlorotoluene	95-49-8	mg/kg								
RA_SE_VOCs	2-Hexanone	591-78-6	mg/kg								
RA_SE_VOCs	4-Chlorotoluene	106-43-4	mg/kg								
RA_SE_VOCs	4-Isopropyltoluene	99-87-6	mg/kg								
RA_SE_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg								
RA_SE_VOCs	Acetone	67-64-1	mg/kg								
RA_SE_VOCs	Benzene	71-43-2	mg/kg								
RA_SE_VOCs	Bromobenzene	108-86-1	mg/kg								
RA_SE_VOCs	Bromochloromethane	74-97-5	mg/kg								
RA_SE_VOCs	Bromodichloromethane	75-27-4	mg/kg								
RA_SE_VOCs	Bromoform	75-25-2	mg/kg								
RA_SE_VOCs	Bromomethane	74-83-9	mg/kg								
RA_SE_VOCs	Carbon Disulfide	75-15-0	mg/kg								
RA_SE_VOCs	Carbon Tetrachloride	56-23-5	mg/kg								
RA_SE_VOCs	Chlorobenzene	108-90-7	mg/kg								
RA_SE_VOCs	Chloroethane	75-00-3	mg/kg								
RA_SE_VOCs	Chloroform	67-66-3	mg/kg								
RA_SE_VOCs	Chloromethane	74-87-3	mg/kg								
RA_SE_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg								
RA_SE_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg								
RA_SE_VOCs	dibromochloromethane	124-48-1	mg/kg								
RA_SE_VOCs	Dibromomethane	74-95-3	mg/kg								
RA_SE_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg								
RA_SE_VOCs	Ethylbenzene	100-41-4	mg/kg								
RA_SE_VOCs	Hexachlorobutadiene	87-68-3	mg/kg								
RA_SE_VOCs	Isopropylbenzene	98-82-8	mg/kg								
RA_SE_VOCs	M,P-Xylenes	179601-23-1	mg/kg								
RA_SE_VOCs	Methylene Chloride	75-09-2	mg/kg								
RA_SE_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg								
RA_SE_VOCs	Naphthalene	91-20-3	mg/kg								
RA_SE_VOCs	n-Butylbenzene	104-51-8	mg/kg								
RA_SE_VOCs	n-Propylbenzene	103-65-1	mg/kg								
RA_SE_VOCs	O-Xylene	95-47-6	mg/kg								
RA_SE_VOCs	sec-Butylbenzene	135-98-8	mg/kg								
RA_SE_VOCs	Styrene	100-42-5	mg/kg								

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SED-331	SED-332	SED-333	SED-333	SED-334	SED-335	SED-335
			Sample Type Code	N	N	N	N	N	N	N
			Sample ID	SED-331-CI20-0-0.5	SED-332-CI19-0-0.5	SED-333-CI19-0-0.5	SED-333-CI20-0-0.5	SED-334-CI19-0-0.5	SED-335-CI19-0-0.5	SED-335-CI20-0-0.5
			Sample Date	5/28/2020	10/2/2019	10/2/2019	5/28/2020	10/2/2019	10/2/2019	5/28/2020
			Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SE_VOCs	tert-Butylbenzene	98-06-6	mg/kg							
RA_SE_VOCs	Tetrachloroethene	127-18-4	mg/kg							
RA_SE_VOCs	Toluene	108-88-3	mg/kg							
RA_SE_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg							
RA_SE_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg							
RA_SE_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg							
RA_SE_VOCs	Trichloroethylene	79-01-6	mg/kg							
RA_SE_VOCs	Trichlorofluoromethane	75-69-4	mg/kg							
RA_SE_VOCs	Vinyl Chloride	75-01-4	mg/kg							

Notes:
% = Percent.
AVS-SEM = Acid volatile sulfide and simultaneoulsy extracted metals.
CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
UMOL/G = Micromole per gram.
VOC = Volatile organic compound.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED-336	SED-336	SED-337	SED-337	SED-338	SED-339	SED-339
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	SED-336-CI19-0-0.5	SED-336-CI19-0-0.5-DUP	SED-337-CI19-0-0.5	SED-337-CI20-0-0.5	SED-338-CI19-0-0.5	SED-339-CI19-0-0.5	SED-339-CI20-0-0.5
				Sample Date	10/2/2019	10/2/2019	10/2/2019	5/28/2020	10/2/2019	10/2/2019	5/28/2020
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_AVS-SEM	ACID VOLATILE SULFIDE	18496-25-8	UMOL/G				1.8			0.072 J
RA_SE_AVS-SEM	Antimony	7440-36-0	UMOL/G				0.0011 U			0.00082 U
RA_SE_AVS-SEM	Cadmium	7440-43-9	UMOL/G				0.000235 J			0.000051 J
RA_SE_AVS-SEM	Chromium	7440-47-3	UMOL/G				0.00535 J			0.0143
RA_SE_AVS-SEM	Copper	7440-50-8	UMOL/G				0.00701 J			0.0262
RA_SE_AVS-SEM	Lead	7439-92-1	UMOL/G				0.0100			0.0156
RA_SE_AVS-SEM	Mercury	7439-97-6	UMOL/G				0.000014 UB			0.0000046 JB
RA_SE_AVS-SEM	Nickel	7440-02-0	UMOL/G				0.00296 J			0.0106
RA_SE_AVS-SEM	Silver	7440-22-4	UMOL/G				0.0011 U			0.00078 U
RA_SE_AVS-SEM	Zinc	7440-66-6	UMOL/G				0.0731			0.120
RA_SE_Metals	Aluminum	7429-90-5	mg/kg	23300	18000	5710		3920	2100	
RA_SE_Metals	Antimony	7440-36-0	mg/kg	0.400	0.300 J	0.160		0.0660 J	0.0240 J	
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	11.0	10.4	3.60		2.41	0.910	
RA_SE_Metals	Barium	7440-39-3	mg/kg	25.7	22.6	10.7		7.06	3.78	
RA_SE_Metals	Beryllium	7440-41-7	mg/kg	1.42	1.14	0.554		0.409	0.231	
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.517	0.639	0.564		0.305	0.0720	
RA_SE_Metals	Calcium	7440-70-2	mg/kg	3240	3030	1310		834 J	504	
RA_SE_Metals	Chromium	7440-47-3	mg/kg	36.6	34.5	15.0		10.2 J	4.49	
RA_SE_Metals	Cobalt	7440-48-4	mg/kg	5.79	5.20	3.01		2.00	1.01	
RA_SE_Metals	Copper	7440-50-8	mg/kg	51.1	39.5	20.2		14.2 J	4.35	
RA_SE_Metals	Iron	7439-89-6	mg/kg	17900	16600	12200		7540	4120	
RA_SE_Metals	Lead	7439-92-1	mg/kg	314 J	181 J	111		43.3 J	7.57	
RA_SE_Metals	Magnesium	7439-95-4	mg/kg	7700	7180	2290		1820 J	1080	
RA_SE_Metals	Manganese	7439-96-5	mg/kg	169	160	153		87.6 J	49.8	
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.229	0.140	0.0660		0.0390	0.0110 J	
RA_SE_Metals	Nickel	7440-02-0	mg/kg	18.4	17.0	9.30		5.78	2.62	
RA_SE_Metals	Potassium	7440-09-7	mg/kg	2870	2810	1150		898	531	
RA_SE_Metals	Selenium	7782-49-2	mg/kg	1.23 J	0.970 J	0.340 J		0.170 J	0.0500 J	
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.564	0.397	0.208		0.129	0.0340 J	
RA_SE_Metals	Sodium	7440-23-5	mg/kg	25800	26300	4740		4860	3190	
RA_SE_Metals	Thallium	7440-28-0	mg/kg	0.295	0.220 J	0.130		0.0850 J	0.0510 J	
RA_SE_Metals	Vanadium	7440-62-2	mg/kg	63.1	49.8	16.5		9.71	4.47	
RA_SE_Metals	Zinc	7440-66-6	mg/kg	114	118	92.4		62.4 J	23.1	
RA_SE_Other	Total Organic Carbon	TOC	mg/kg			39000 J			10000 J	
RA_SE_Other	TOTAL SOLIDS	SOLIDS	%				65			84
RA_SE_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.04 UJ	0.037 U	0.016 U		0.014 U	0.012 U	
RA_SE_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.04 UJ	0.037 U	0.016 U		0.014 U	0.012 U	
RA_SE_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.047 UJ	0.044 U	0.019 U		0.016 U	0.014 U	
RA_SE_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.04 UJ	0.037 U	0.016 U		0.014 U	0.012 U	
RA_SE_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.04 UJ	0.037 U	0.016 U		0.014 U	0.012 U	
RA_SE_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.04 UJ	0.037 U	0.016 U		0.014 U	0.012 U	
RA_SE_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.34 J	0.13 J	0.17		0.14	0.0280	
RA_SE_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg							

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED-336	SED-336	SED-337	SED-337	SED-338	SED-339	SED-339
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	SED-336-CI19-0-0.5	SED-336-CI19-0-0.5-DUP	SED-337-CI19-0-0.5	SED-337-CI20-0-0.5	SED-338-CI19-0-0.5	SED-339-CI19-0-0.5	SED-339-CI20-0-0.5
				Sample Date	10/2/2019	10/2/2019	10/2/2019	5/28/2020	10/2/2019	10/2/2019	5/28/2020
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg								
RA_SE_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.34 J	0.13 J	0.17 J		0.14 J	0.0280 J		
RA_SE_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.59	0.36	0.27		0.23	0.10		
RA_SE_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg	0.0630 J	0.0480 J	0.0970		0.0360	0.00410 J		
RA_SE_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg	2.4 U	2.5 U	1 U		0.96 U	0.79 U		
RA_SE_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg	2.4 U	2.5 U	1 U		0.96 U	0.79 U		
RA_SE_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg	0.97 UJ	1 UJ	0.42 UJ		0.38 U	0.32 U		
RA_SE_SVOCs	2-Chlorophenol	95-57-8	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg	0.0770 J	0.0570 J	0.18		0.0530	0.00440 J		
RA_SE_SVOCs	2-Methylphenol	95-48-7	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	2-Nitroaniline	88-74-4	mg/kg	2.4 U	2.5 U	1 U		0.96 U	0.79 U		
RA_SE_SVOCs	2-Nitrophenol	88-75-5	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.97 UJ	1 UJ	0.42 UJ		0.38 UJ	0.32 U		
RA_SE_SVOCs	3-Nitroaniline	99-09-2	mg/kg	2.4 U	2.5 U	1 U		0.96 U	0.79 U		
RA_SE_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	2.4 U	2.5 U	1 U		0.96 U	0.79 U		
RA_SE_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	4-Chloroaniline	106-47-8	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	4-Nitroaniline	100-01-6	mg/kg	2.4 U	2.5 U	1 U		0.96 U	0.79 U		
RA_SE_SVOCs	4-Nitrophenol	100-02-7	mg/kg	2.4 U	2.5 U	1 U		0.96 U	0.79 U		
RA_SE_SVOCs	Acenaphthene	83-32-9	mg/kg	0.0170 J	0.0180 J	0.0390		0.0410	0.0110 J		
RA_SE_SVOCs	Acenaphthylene	208-96-8	mg/kg	0.039 U	0.00980 J	0.0180 J		0.00790 J	0.013 U		
RA_SE_SVOCs	Anthracene	120-12-7	mg/kg	0.0490 J	0.0500 J	0.0640 J		0.0980 J	0.0220 J		
RA_SE_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg	0.29	0.27	0.48		0.34 J	0.0890		
RA_SE_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg	0.47 J	0.38 J	0.75 J		0.42 J	0.0930 J		
RA_SE_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.58	0.5	0.81		0.53	0.14		
RA_SE_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.29	0.2	0.41		0.25 J	0.0460		
RA_SE_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.2	0.17	0.23		0.17 J	0.0440		
RA_SE_SVOCs	Benzoic acid	65-85-0	mg/kg	2.4 UJ	2.5 UJ	1 UJ		0.96 UJ	0.79 UJ		
RA_SE_SVOCs	Benzyl Alcohol	100-51-6	mg/kg	1.9 U	2 U	0.83 U		0.77 U	0.64 U		
RA_SE_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		
RA_SE_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U		

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED-336	SED-336	SED-337	SED-337	SED-338	SED-339	SED-339
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	SED-336-CI19-0-0.5	SED-336-CI19-0-0.5-DUP	SED-337-CI19-0-0.5	SED-337-CI20-0-0.5	SED-338-CI19-0-0.5	SED-339-CI19-0-0.5	SED-339-CI20-0-0.5
				Sample Date	10/2/2019	10/2/2019	10/2/2019	5/28/2020	10/2/2019	10/2/2019	5/28/2020
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.97 U	1 U	0.18 J		0.38 U	0.29 J	
RA_SE_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Carbazole	86-74-8	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Chrysene	218-01-9	mg/kg	0.47	0.4	0.71		0.47	0.0910	
RA_SE_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.0970	0.0660 J	0.13		0.0730	0.0180 J	
RA_SE_SVOCs	Dibenzofuran	132-64-9	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Diethyl Phthalate	84-66-2	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Fluoranthene	206-44-0	mg/kg	0.52	0.49	1.1		0.74	0.18	
RA_SE_SVOCs	Fluorene	86-73-7	mg/kg	0.0520 J	0.0420 J	0.0720		0.0650	0.0140 J	
RA_SE_SVOCs	Hexachlorobenzene	118-74-1	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Hexachloroethane	67-72-1	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.32	0.22	0.35		0.25 J	0.0590	
RA_SE_SVOCs	Isophorone	78-59-1	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Naphthalene	91-20-3	mg/kg	0.12	0.0840	0.21		0.0860	0.00720 J	
RA_SE_SVOCs	Nitrobenzene	98-95-3	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Pentachlorophenol	87-86-5	mg/kg	2.4 U	2.5 U	1 U		0.96 U	0.79 U	
RA_SE_SVOCs	Phenanthrene	85-01-8	mg/kg	0.52	0.45	0.56		0.55	0.12	
RA_SE_SVOCs	Phenol	108-95-2	mg/kg	0.97 U	1 U	0.42 U		0.38 U	0.32 U	
RA_SE_SVOCs	Pyrene	129-00-0	mg/kg	0.98 J	0.78 J	1.5 J		0.98	0.17	
RA_SE_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	4.2	3.5	6.5		4.2	0.93	
RA_SE_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.92	0.76	1.2		0.94	0.19	
RA_SE_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg	5.1	4.2	7.7		5.2	1.1	
RA_SE_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg							
RA_SE_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg							
RA_SE_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg							
RA_SE_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg							
RA_SE_VOCs	1,1-Dichloroethane	75-34-3	mg/kg							
RA_SE_VOCs	1,1-Dichloroethene	75-35-4	mg/kg							
RA_SE_VOCs	1,1-Dichloropropene	563-58-6	mg/kg							
RA_SE_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg							
RA_SE_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg							
RA_SE_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg							
RA_SE_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg							
RA_SE_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg							
RA_SE_VOCs	1,2-Dibromoethane	106-93-4	mg/kg							
RA_SE_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg							

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SED-336	SED-336	SED-337	SED-337	SED-338	SED-339	SED-339
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	SED-336-CI19-0-0.5	SED-336-CI19-0-0.5-DUP	SED-337-CI19-0-0.5	SED-337-CI20-0-0.5	SED-338-CI19-0-0.5	SED-339-CI19-0-0.5	SED-339-CI20-0-0.5
				Sample Date	10/2/2019	10/2/2019	10/2/2019	5/28/2020	10/2/2019	10/2/2019	5/28/2020
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units								
RA_SE_VOCs	1,2-Dichloroethane	107-06-2	mg/kg								
RA_SE_VOCs	1,2-Dichloropropane	78-87-5	mg/kg								
RA_SE_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg								
RA_SE_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg								
RA_SE_VOCs	1,3-Dichloropropane	142-28-9	mg/kg								
RA_SE_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg								
RA_SE_VOCs	2,2-Dichloropropane	594-20-7	mg/kg								
RA_SE_VOCs	2-Butanone (MEK)	78-93-3	mg/kg								
RA_SE_VOCs	2-Chlorotoluene	95-49-8	mg/kg								
RA_SE_VOCs	2-Hexanone	591-78-6	mg/kg								
RA_SE_VOCs	4-Chlorotoluene	106-43-4	mg/kg								
RA_SE_VOCs	4-Isopropyltoluene	99-87-6	mg/kg								
RA_SE_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg								
RA_SE_VOCs	Acetone	67-64-1	mg/kg								
RA_SE_VOCs	Benzene	71-43-2	mg/kg								
RA_SE_VOCs	Bromobenzene	108-86-1	mg/kg								
RA_SE_VOCs	Bromochloromethane	74-97-5	mg/kg								
RA_SE_VOCs	Bromodichloromethane	75-27-4	mg/kg								
RA_SE_VOCs	Bromoform	75-25-2	mg/kg								
RA_SE_VOCs	Bromomethane	74-83-9	mg/kg								
RA_SE_VOCs	Carbon Disulfide	75-15-0	mg/kg								
RA_SE_VOCs	Carbon Tetrachloride	56-23-5	mg/kg								
RA_SE_VOCs	Chlorobenzene	108-90-7	mg/kg								
RA_SE_VOCs	Chloroethane	75-00-3	mg/kg								
RA_SE_VOCs	Chloroform	67-66-3	mg/kg								
RA_SE_VOCs	Chloromethane	74-87-3	mg/kg								
RA_SE_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg								
RA_SE_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg								
RA_SE_VOCs	dibromochloromethane	124-48-1	mg/kg								
RA_SE_VOCs	Dibromomethane	74-95-3	mg/kg								
RA_SE_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg								
RA_SE_VOCs	Ethylbenzene	100-41-4	mg/kg								
RA_SE_VOCs	Hexachlorobutadiene	87-68-3	mg/kg								
RA_SE_VOCs	Isopropylbenzene	98-82-8	mg/kg								
RA_SE_VOCs	M,P-Xylenes	179601-23-1	mg/kg								
RA_SE_VOCs	Methylene Chloride	75-09-2	mg/kg								
RA_SE_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg								
RA_SE_VOCs	Naphthalene	91-20-3	mg/kg								
RA_SE_VOCs	n-Butylbenzene	104-51-8	mg/kg								
RA_SE_VOCs	n-Propylbenzene	103-65-1	mg/kg								
RA_SE_VOCs	O-Xylene	95-47-6	mg/kg								
RA_SE_VOCs	sec-Butylbenzene	135-98-8	mg/kg								
RA_SE_VOCs	Styrene	100-42-5	mg/kg								

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SED-336	SED-336	SED-337	SED-337	SED-338	SED-339	SED-339
			Sample Type Code	N	FD	N	N	N	N	N
			Sample ID	SED-336-CI19-0-0.5	SED-336-CI19-0-0.5-DUP	SED-337-CI19-0-0.5	SED-337-CI20-0-0.5	SED-338-CI19-0-0.5	SED-339-CI19-0-0.5	SED-339-CI20-0-0.5
			Sample Date	10/2/2019	10/2/2019	10/2/2019	5/28/2020	10/2/2019	10/2/2019	5/28/2020
			Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units							
RA_SE_VOCs	tert-Butylbenzene	98-06-6	mg/kg							
RA_SE_VOCs	Tetrachloroethene	127-18-4	mg/kg							
RA_SE_VOCs	Toluene	108-88-3	mg/kg							
RA_SE_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg							
RA_SE_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg							
RA_SE_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg							
RA_SE_VOCs	Trichloroethylene	79-01-6	mg/kg							
RA_SE_VOCs	Trichlorofluoromethane	75-69-4	mg/kg							
RA_SE_VOCs	Vinyl Chloride	75-01-4	mg/kg							

Notes:
% = Percent.
AVS-SEM = Acid volatile sulfide and simultaneoulsy extracted metals.
CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
UMOL/G = Micromole per gram.
VOC = Volatile organic compound.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SED-340
			Sample Type Code	N
			Sample ID	SED-340-CI19-0-0.5
			Sample Date	10/2/2019
			Depth Interval	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units	
RA_SE_AVS-SEM	ACID VOLATILE SULFIDE	18496-25-8	UMOL/G	
RA_SE_AVS-SEM	Antimony	7440-36-0	UMOL/G	
RA_SE_AVS-SEM	Cadmium	7440-43-9	UMOL/G	
RA_SE_AVS-SEM	Chromium	7440-47-3	UMOL/G	
RA_SE_AVS-SEM	Copper	7440-50-8	UMOL/G	
RA_SE_AVS-SEM	Lead	7439-92-1	UMOL/G	
RA_SE_AVS-SEM	Mercury	7439-97-6	UMOL/G	
RA_SE_AVS-SEM	Nickel	7440-02-0	UMOL/G	
RA_SE_AVS-SEM	Silver	7440-22-4	UMOL/G	
RA_SE_AVS-SEM	Zinc	7440-66-6	UMOL/G	
RA_SE_Metals	Aluminum	7429-90-5	mg/kg	2300
RA_SE_Metals	Antimony	7440-36-0	mg/kg	0.0210 J
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	0.590
RA_SE_Metals	Barium	7440-39-3	mg/kg	3.03
RA_SE_Metals	Beryllium	7440-41-7	mg/kg	0.215
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.0130 J
RA_SE_Metals	Calcium	7440-70-2	mg/kg	310
RA_SE_Metals	Chromium	7440-47-3	mg/kg	3.24
RA_SE_Metals	Cobalt	7440-48-4	mg/kg	1.06
RA_SE_Metals	Copper	7440-50-8	mg/kg	3.54
RA_SE_Metals	Iron	7439-89-6	mg/kg	4030
RA_SE_Metals	Lead	7439-92-1	mg/kg	9.27
RA_SE_Metals	Magnesium	7439-95-4	mg/kg	894
RA_SE_Metals	Manganese	7439-96-5	mg/kg	43.2
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.0120 J
RA_SE_Metals	Nickel	7440-02-0	mg/kg	2.85
RA_SE_Metals	Potassium	7440-09-7	mg/kg	423
RA_SE_Metals	Selenium	7782-49-2	mg/kg	0.2 U
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.00900 J
RA_SE_Metals	Sodium	7440-23-5	mg/kg	1410
RA_SE_Metals	Thallium	7440-28-0	mg/kg	0.0320 J
RA_SE_Metals	Vanadium	7440-62-2	mg/kg	4.45
RA_SE_Metals	Zinc	7440-66-6	mg/kg	19.0
RA_SE_Other	Total Organic Carbon	TOC	mg/kg	
RA_SE_Other	TOTAL SOLIDS	SOLIDS	%	
RA_SE_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.01 U
RA_SE_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.01 U
RA_SE_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.012 U
RA_SE_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.01 U
RA_SE_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.01 U
RA_SE_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.01 U
RA_SE_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.0560
RA_SE_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg	

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SED-340
			Sample Type Code	N
			Sample ID	SED-340-CI19-0-0.5
			Sample Date	10/2/2019
			Depth Interval	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units	
RA_SE_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg	
RA_SE_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.0560 J
RA_SE_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.12
RA_SE_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.27 U
RA_SE_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.27 U
RA_SE_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.27 U
RA_SE_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.27 U
RA_SE_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg	0.0100 J
RA_SE_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg	0.67 U
RA_SE_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg	0.27 U
RA_SE_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg	0.27 U
RA_SE_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg	0.27 U
RA_SE_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg	0.67 U
RA_SE_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg	0.27 U
RA_SE_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg	0.27 U
RA_SE_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg	0.27 U
RA_SE_SVOCs	2-Chlorophenol	95-57-8	mg/kg	0.27 U
RA_SE_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg	0.0120 J
RA_SE_SVOCs	2-Methylphenol	95-48-7	mg/kg	0.27 U
RA_SE_SVOCs	2-Nitroaniline	88-74-4	mg/kg	0.67 U
RA_SE_SVOCs	2-Nitrophenol	88-75-5	mg/kg	0.27 U
RA_SE_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg	0.27 U
RA_SE_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.27 U
RA_SE_SVOCs	3-Nitroaniline	99-09-2	mg/kg	0.67 U
RA_SE_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	0.67 U
RA_SE_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.27 U
RA_SE_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.27 U
RA_SE_SVOCs	4-Chloroaniline	106-47-8	mg/kg	0.27 U
RA_SE_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.27 U
RA_SE_SVOCs	4-Nitroaniline	100-01-6	mg/kg	0.67 U
RA_SE_SVOCs	4-Nitrophenol	100-02-7	mg/kg	0.67 U
RA_SE_SVOCs	Acenaphthene	83-32-9	mg/kg	0.011 U
RA_SE_SVOCs	Acenaphthylene	208-96-8	mg/kg	0.00410 J
RA_SE_SVOCs	Anthracene	120-12-7	mg/kg	0.011 UJ
RA_SE_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg	0.0250
RA_SE_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg	0.0480 J
RA_SE_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg	0.0580
RA_SE_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	0.0270
RA_SE_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg	0.0190 J
RA_SE_SVOCs	Benzoic acid	65-85-0	mg/kg	0.67 UJ
RA_SE_SVOCs	Benzyl Alcohol	100-51-6	mg/kg	0.54 U
RA_SE_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.27 U
RA_SE_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.27 U

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SED-340
			Sample Type Code	N
			Sample ID	SED-340-CI19-0-0.5
			Sample Date	10/2/2019
			Depth Interval	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units	
RA_SE_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.27 U
RA_SE_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.11 J
RA_SE_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.27 U
RA_SE_SVOCs	Carbazole	86-74-8	mg/kg	0.27 U
RA_SE_SVOCs	Chrysene	218-01-9	mg/kg	0.0590
RA_SE_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.00870 J
RA_SE_SVOCs	Dibenzofuran	132-64-9	mg/kg	0.27 U
RA_SE_SVOCs	Diethyl Phthalate	84-66-2	mg/kg	0.27 U
RA_SE_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg	0.27 U
RA_SE_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.27 U
RA_SE_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.27 U
RA_SE_SVOCs	Fluoranthene	206-44-0	mg/kg	0.0480
RA_SE_SVOCs	Fluorene	86-73-7	mg/kg	0.00580 J
RA_SE_SVOCs	Hexachlorobenzene	118-74-1	mg/kg	0.27 U
RA_SE_SVOCs	Hexachloroethane	67-72-1	mg/kg	0.27 U
RA_SE_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	0.0310
RA_SE_SVOCs	Isophorone	78-59-1	mg/kg	0.27 U
RA_SE_SVOCs	Naphthalene	91-20-3	mg/kg	0.0200 J
RA_SE_SVOCs	Nitrobenzene	98-95-3	mg/kg	0.27 U
RA_SE_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.27 U
RA_SE_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.27 U
RA_SE_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.27 U
RA_SE_SVOCs	Pentachlorophenol	87-86-5	mg/kg	0.67 U
RA_SE_SVOCs	Phenanthrene	85-01-8	mg/kg	0.0730
RA_SE_SVOCs	Phenol	108-95-2	mg/kg	0.27 U
RA_SE_SVOCs	Pyrene	129-00-0	mg/kg	0.0860
RA_SE_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	0.41
RA_SE_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	0.14
RA_SE_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg	0.55
RA_SE_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	
RA_SE_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg	
RA_SE_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	
RA_SE_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg	
RA_SE_VOCs	1,1-Dichloroethane	75-34-3	mg/kg	
RA_SE_VOCs	1,1-Dichloroethene	75-35-4	mg/kg	
RA_SE_VOCs	1,1-Dichloropropene	563-58-6	mg/kg	
RA_SE_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	
RA_SE_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg	
RA_SE_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	
RA_SE_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	
RA_SE_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	
RA_SE_VOCs	1,2-Dibromoethane	106-93-4	mg/kg	
RA_SE_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SED-340
			Sample Type Code	N
			Sample ID	SED-340-CI19-0-0.5
			Sample Date	10/2/2019
			Depth Interval	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units	
RA_SE_VOCs	1,2-Dichloroethane	107-06-2	mg/kg	
RA_SE_VOCs	1,2-Dichloropropane	78-87-5	mg/kg	
RA_SE_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	
RA_SE_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	
RA_SE_VOCs	1,3-Dichloropropane	142-28-9	mg/kg	
RA_SE_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	
RA_SE_VOCs	2,2-Dichloropropane	594-20-7	mg/kg	
RA_SE_VOCs	2-Butanone (MEK)	78-93-3	mg/kg	
RA_SE_VOCs	2-Chlorotoluene	95-49-8	mg/kg	
RA_SE_VOCs	2-Hexanone	591-78-6	mg/kg	
RA_SE_VOCs	4-Chlorotoluene	106-43-4	mg/kg	
RA_SE_VOCs	4-Isopropyltoluene	99-87-6	mg/kg	
RA_SE_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg	
RA_SE_VOCs	Acetone	67-64-1	mg/kg	
RA_SE_VOCs	Benzene	71-43-2	mg/kg	
RA_SE_VOCs	Bromobenzene	108-86-1	mg/kg	
RA_SE_VOCs	Bromochloromethane	74-97-5	mg/kg	
RA_SE_VOCs	Bromodichloromethane	75-27-4	mg/kg	
RA_SE_VOCs	Bromoform	75-25-2	mg/kg	
RA_SE_VOCs	Bromomethane	74-83-9	mg/kg	
RA_SE_VOCs	Carbon Disulfide	75-15-0	mg/kg	
RA_SE_VOCs	Carbon Tetrachloride	56-23-5	mg/kg	
RA_SE_VOCs	Chlorobenzene	108-90-7	mg/kg	
RA_SE_VOCs	Chloroethane	75-00-3	mg/kg	
RA_SE_VOCs	Chloroform	67-66-3	mg/kg	
RA_SE_VOCs	Chloromethane	74-87-3	mg/kg	
RA_SE_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg	
RA_SE_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	
RA_SE_VOCs	dibromochloromethane	124-48-1	mg/kg	
RA_SE_VOCs	Dibromomethane	74-95-3	mg/kg	
RA_SE_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg	
RA_SE_VOCs	Ethylbenzene	100-41-4	mg/kg	
RA_SE_VOCs	Hexachlorobutadiene	87-68-3	mg/kg	
RA_SE_VOCs	Isopropylbenzene	98-82-8	mg/kg	
RA_SE_VOCs	M,P-Xylenes	179601-23-1	mg/kg	
RA_SE_VOCs	Methylene Chloride	75-09-2	mg/kg	
RA_SE_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	
RA_SE_VOCs	Naphthalene	91-20-3	mg/kg	
RA_SE_VOCs	n-Butylbenzene	104-51-8	mg/kg	
RA_SE_VOCs	n-Propylbenzene	103-65-1	mg/kg	
RA_SE_VOCs	O-Xylene	95-47-6	mg/kg	
RA_SE_VOCs	sec-Butylbenzene	135-98-8	mg/kg	
RA_SE_VOCs	Styrene	100-42-5	mg/kg	

ATTACHMENT A, TABLE A-5C
SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	Off-Project Red Maple Swamp / Tidal Stream Area
			Location ID	SED-340
			Sample Type Code	N
			Sample ID	SED-340-CI19-0-0.5
			Sample Date	10/2/2019
			Depth Interval	0 - 0.5 ft
Method Analyte Group	Compound	CAS #	Units	
RA_SE_VOCs	tert-Butylbenzene	98-06-6	mg/kg	
RA_SE_VOCs	Tetrachloroethene	127-18-4	mg/kg	
RA_SE_VOCs	Toluene	108-88-3	mg/kg	
RA_SE_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg	
RA_SE_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg	
RA_SE_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	
RA_SE_VOCs	Trichloroethylene	79-01-6	mg/kg	
RA_SE_VOCs	Trichlorofluoromethane	75-69-4	mg/kg	
RA_SE_VOCs	Vinyl Chloride	75-01-4	mg/kg	

Notes:
% = Percent.
AVS-SEM = Acid volatile sulfide and simultaneoulsy extracted metals.
CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
UMOL/G = Micromole per gram.
VOC = Volatile organic compound.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-5D
BACKGROUND SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	SE-Background Beachfront	SE-Background Beachfront	SE-Background Beachfront	SE-Background Beachfront	SE-Background Beachfront	SE-Background Beachfront	SE-Background Beachfront
			Location ID	SED-311	SED-311	SED-312	SED-313	SED-314	SED-315	SED-316
			Depth Interval	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
			Sample Type Code	N	FD	N	N	N	N	N
			Sample ID	SED-311-CI20-0-1	SED-311-CI20-0-1-DUP	SED-312-CI20-0-1	SED-313-CI20-0-1	SED-314-CI20-0-1	SED-315-CI20-0-1	SED-316-CI20-0-1
			Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units							
RA_SE_Metals	Aluminum	7429-90-5	mg/kg	3890	4680	4510	4820	3460	5450	7710
RA_SE_Metals	Antimony	7440-36-0	mg/kg	0.120	0.043 U	0.048 U	0.045 U	0.046 U	0.05 UJ	0.049 U
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	1.60	1.37	1.45	1.52	1.30	1.40	1.72
RA_SE_Metals	Barium	7440-39-3	mg/kg	6.57	5.87	5.90	5.84	4.59	16.0	25.2
RA_SE_Metals	Beryllium	7440-41-7	mg/kg	0.663	0.694	0.759	0.624	0.510	0.938	0.636
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.023 U	0.017 U	0.019 U	0.018 U	0.019 U	0.02 U	0.02 U
RA_SE_Metals	Calcium	7440-70-2	mg/kg	13600 J	35800 J	6310	5550	2000	3040 J	2220
RA_SE_Metals	Chromium	7440-47-3	mg/kg	5.36	4.74	5.44	6.76	4.46	8.54	9.69
RA_SE_Metals	Cobalt	7440-48-4	mg/kg	4.16	3.30	4.28	3.25	2.81	4.25	4.97
RA_SE_Metals	Copper	7440-50-8	mg/kg	8.93 B	8.30 B	7.29 B	5.36 B	5.73 B	9.10 B	7.91 B
RA_SE_Metals	Iron	7439-89-6	mg/kg	11400	11300	11700	12200	7740	13700	14000
RA_SE_Metals	Lead	7439-92-1	mg/kg	7.94	7.96	8.10	5.52	4.18	7.47 J	7.67
RA_SE_Metals	Magnesium	7439-95-4	mg/kg	1700	2060	1870	2250	1580	2110	3130
RA_SE_Metals	Manganese	7439-96-5	mg/kg	149 B	144 B	178 B	126 B	118 B	137 B	168 B
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.00490 J	0.00940 J	0.00850 J	0.00690 J	0.00740 J	0.00660 J	0.0110 J
RA_SE_Metals	Nickel	7440-02-0	mg/kg	4.70	5.14	6.26	6.90	5.28	10.4	9.40
RA_SE_Metals	Potassium	7440-09-7	mg/kg	692	705	686	615	523	1020 J	1780
RA_SE_Metals	Selenium	7782-49-2	mg/kg	0.200 J	0.0750 J	0.0800 J	0.0850 J	0.0510 J	0.110 J	0.0860 J
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.0150 J	0.0180 J	0.0180 J	0.0200 J	0.0130 J	0.0120 J	0.0130 J
RA_SE_Metals	Sodium	7440-23-5	mg/kg	264 J	510 J	177	142	114	164	414
RA_SE_Metals	Thallium	7440-28-0	mg/kg	0.046 U	0.034 U	0.038 U	0.036 U	0.037 U	0.04 U	0.150
RA_SE_Metals	Vanadium	7440-62-2	mg/kg	7.83	7.24	8.29	11.0	6.15	11.4	14.5
RA_SE_Metals	Zinc	7440-66-6	mg/kg	30.8	33.4	36.8	32.8	24.2	31.4	34.2
RA_SE_Other	Total Organic Carbon	TOC	mg/kg	14000 J	14000 J	6900 J	8500 J	9400 J	13000 J	

Notes:
B = Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.
CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
SE = Sediment.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.

ATTACHMENT A, TABLE A-5D
BACKGROUND SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SE-Background Beachfront	SE-Background Beachfront	SE-Background Beachfront	SE-Background Beachfront
				Location ID	SED-317	SED-318	SED-319	SED-320
				Depth Interval	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
				Sample Type Code	N	N	N	N
				Sample ID	SED-317-CI20-0-1	SED-318-CI20-0-1	SED-319-CI20-0-1	SED-320-CI20-0-1
				Sample Date	5/22/2020	5/22/2020	5/22/2020	5/22/2020
Method Analyte Group	Compound	CAS #	Units					
RA_SE_Metals	Aluminum	7429-90-5	mg/kg	7040	6790	7600	4140
RA_SE_Metals	Antimony	7440-36-0	mg/kg	0.047 U	0.046 U	0.046 U	0.058 U
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	1.46	1.98	2.05	1.50
RA_SE_Metals	Barium	7440-39-3	mg/kg	23.0	20.8	7.73	9.96
RA_SE_Metals	Beryllium	7440-41-7	mg/kg	0.514	0.919	0.752	0.559
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.019 U	0.018 U	0.018 U	0.023 U
RA_SE_Metals	Calcium	7440-70-2	mg/kg	28800	5000	14400	1180
RA_SE_Metals	Chromium	7440-47-3	mg/kg	11.1	9.96	8.98	5.16
RA_SE_Metals	Cobalt	7440-48-4	mg/kg	4.34	7.69	4.44	2.45
RA_SE_Metals	Copper	7440-50-8	mg/kg	5.09 B	13.2 B	10.6 B	6.18 B
RA_SE_Metals	Iron	7439-89-6	mg/kg	12700	15000	15800	8540
RA_SE_Metals	Lead	7439-92-1	mg/kg	7.36	7.49	7.51	4.34
RA_SE_Metals	Magnesium	7439-95-4	mg/kg	3830	2860	3840	1710
RA_SE_Metals	Manganese	7439-96-5	mg/kg	149 B	221 B	180 B	101 B
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.0200 J	0.0140 J	0.0100 J	0.00580 J
RA_SE_Metals	Nickel	7440-02-0	mg/kg	8.36	9.74	9.80	5.06
RA_SE_Metals	Potassium	7440-09-7	mg/kg	1930	1420	1090	863
RA_SE_Metals	Selenium	7782-49-2	mg/kg	0.0750 J	0.0680 J	0.0900 J	0.0650 J
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.0300 J	0.0410 J	0.0230 J	0.00790 J
RA_SE_Metals	Sodium	7440-23-5	mg/kg	574	355	693	740
RA_SE_Metals	Thallium	7440-28-0	mg/kg	0.149	0.106	0.128	0.046 U
RA_SE_Metals	Vanadium	7440-62-2	mg/kg	12.8	16.2	14.1	8.58
RA_SE_Metals	Zinc	7440-66-6	mg/kg	28.6	31.2	41.5	22.4
RA_SE_Other	Total Organic Carbon	TOC	mg/kg				

Notes:
B = Indicates the analyte was detected in the laboratory method blank
analyzed concurrently with the sample.
CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated nun
value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
SE = Sediment.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approxima

ATTACHMENT A, TABLE A-5E
BACKGROUND SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North
				Location ID	SED 1	SED 1	SED-101-2014	SED-321	SED-321	SED-322	SED-322
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	SED 1A 0-0.5	SED 1A 0-0.5DUP	SED-101-A-2014	SED-321-CI19-0-0.5	SED-321-CI20-0-0.5	SED-322-CI19-0-0.5	SED-322-CI20-0-0.5
				Sample Date	11/30/2011	11/30/2011	8/5/2014	10/1/2019	5/28/2020	10/1/2019	5/28/2020
Method Analyte Group	Compound	CAS #	Units								
RA_SE_AVS-SEM	ACID VOLATILE SULFIDE	18496-25-8	UMOL/G						0.061 J		0.13 U
RA_SE_AVS-SEM	Antimony	7440-36-0	UMOL/G						0.0011 U		0.0011 U
RA_SE_AVS-SEM	Cadmium	7440-43-9	UMOL/G						0.000529 J		0.000319 J
RA_SE_AVS-SEM	Chromium	7440-47-3	UMOL/G						0.0570		0.0376
RA_SE_AVS-SEM	Copper	7440-50-8	UMOL/G						0.147		0.105
RA_SE_AVS-SEM	Lead	7439-92-1	UMOL/G						0.141		0.106
RA_SE_AVS-SEM	Mercury	7439-97-6	UMOL/G						0.0000462 B		0.0000178 JB
RA_SE_AVS-SEM	Nickel	7440-02-0	UMOL/G						0.0468		0.0311
RA_SE_AVS-SEM	Silver	7440-22-4	UMOL/G						0.00089 J		0.00052 J
RA_SE_AVS-SEM	Zinc	7440-66-6	UMOL/G						0.418		0.215
RA_SE_Metals	Aluminum	7429-90-5	mg/kg					6000		6280	
RA_SE_Metals	Antimony	7440-36-0	mg/kg					0.140		0.130	
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	0.3 J		4.7	2.50			2.38	
RA_SE_Metals	Barium	7440-39-3	mg/kg	10.4		5.9	22.2			15.9	
RA_SE_Metals	Beryllium	7440-41-7	mg/kg				0.435			0.540	
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.4 U		0.2 U	0.0490 J			0.0640 J	
RA_SE_Metals	Calcium	7440-70-2	mg/kg				931			726	
RA_SE_Metals	Chromium	7440-47-3	mg/kg	5.1		5.4	9.30			9.45	
RA_SE_Metals	Cobalt	7440-48-4	mg/kg				2.48			2.51	
RA_SE_Metals	Copper	7440-50-8	mg/kg				11.4			11.6	
RA_SE_Metals	Iron	7439-89-6	mg/kg				8370			8430	
RA_SE_Metals	Lead	7439-92-1	mg/kg	11.3		54.2	28.2			28.4	
RA_SE_Metals	Magnesium	7439-95-4	mg/kg				1960			1400	
RA_SE_Metals	Manganese	7439-96-5	mg/kg				127			97.4	
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.039	0.0211 J	0.028 J	0.0530			0.0370 J	
RA_SE_Metals	Nickel	7440-02-0	mg/kg				6.00			6.04	
RA_SE_Metals	Potassium	7440-09-7	mg/kg				1030			648	
RA_SE_Metals	Selenium	7782-49-2	mg/kg	0.6 J		2.7 UJ	0.170 J			0.160 J	
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.4 U		0.2 U	0.0440 J			0.0510 J	
RA_SE_Metals	Sodium	7440-23-5	mg/kg				144			109	
RA_SE_Metals	Thallium	7440-28-0	mg/kg				0.0920 J			0.0934 J	
RA_SE_Metals	Vanadium	7440-62-2	mg/kg				12.9			11.2	
RA_SE_Metals	Zinc	7440-66-6	mg/kg				46.8			50.1	
RA_SE_Other	Total Organic Carbon	TOC	mg/kg				24000 J				50000
RA_SE_Other	Total Petroleum Hydrocarbons	TPH	mg/kg			101					
RA_SE_Other	TOTAL SOLIDS	SOLIDS	%						65		60
RA_SE_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.0701 U		0.0415 U	0.0048 U			0.0046 U	
RA_SE_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.0701 U		0.0415 U	0.0048 U			0.0046 U	
RA_SE_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.0701 U		0.0415 U	0.0057 U			0.0054 U	
RA_SE_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.0701 U		0.0415 U	0.0048 U			0.0046 U	
RA_SE_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.0701 U		0.061 J	0.0048 U			0.0046 U	
RA_SE_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.0701 U		0.0415 U	0.0048 U			0.0046 U	
RA_SE_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.0701 U		0.0579 J	0.0048 U			0.0046 UJ	
RA_SE_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg	0.0701 U		0.0415 U					
RA_SE_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg	0.0701 U		0.0415 U					
RA_SE_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg				0.034 U			0.033 U	
RA_SE_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.63 U		0.41	0.035 U			0.033 U	

ATTACHMENT A, TABLE A-5E
BACKGROUND SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SE-Background	SE-Background	SE-Background	SE-Background	SE-Background	SE-Background	SE-Background
				Location ID	Tidal Stream North	Tidal Stream North	Tidal Stream North	Tidal Stream North	Tidal Stream North	Tidal Stream North	Tidal Stream North
				Depth Interval	SED 1	SED 1	SED-101-2014	SED-321	SED-321	SED-322	SED-322
				Sample Type Code	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
				Sample ID	N	FD	N	N	N	N	N
				Sample Date	SED 1A 0-0.5	SED 1A 0-0.5DUP	SED-101-A-2014	SED-321-CI19-0-0.5	SED-321-CI20-0-0.5	SED-322-CI19-0-0.5	SED-322-CI20-0-0.5
					11/30/2011	11/30/2011	8/5/2014	10/1/2019	5/28/2020	10/1/2019	5/28/2020
Method Analyte Group	Compound	CAS #	Units								
RA_SE_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg				0.055 U		0.054 U		
RA_SE_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg			0.239 U	0.68 U		0.66 U		
RA_SE_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg			1.19 U	0.68 U		0.66 U		
RA_SE_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg			0.239 U	0.27 UJ		0.27 UJ		
RA_SE_SVOCs	2-Chlorophenol	95-57-8	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg			0.239 U	0.055 U		0.054 U		
RA_SE_SVOCs	2-Methylphenol	95-48-7	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	2-Nitroaniline	88-74-4	mg/kg			0.239 U	0.68 U		0.66 U		
RA_SE_SVOCs	2-Nitrophenol	88-75-5	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg			0.477 U	0.27 U		0.27 U		
RA_SE_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg			0.239 U	0.27 UJ		0.27 UJ		
RA_SE_SVOCs	3-Nitroaniline	99-09-2	mg/kg			0.239 U	0.68 U		0.66 U		
RA_SE_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg			1.19 UJ	0.68 U		0.66 U		
RA_SE_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	4-Chloroaniline	106-47-8	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	4-Nitroaniline	100-01-6	mg/kg			0.239 U	0.68 U		0.66 U		
RA_SE_SVOCs	4-Nitrophenol	100-02-7	mg/kg			1.19 U	0.68 U		0.66 U		
RA_SE_SVOCs	Acenaphthene	83-32-9	mg/kg			0.239 U	0.0310 J		0.0360 J		
RA_SE_SVOCs	Acenaphthylene	208-96-8	mg/kg			0.239 U	0.055 U		0.054 U		
RA_SE_SVOCs	Anthracene	120-12-7	mg/kg			0.256 J	0.12 J		0.18 J		
RA_SE_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg			2.64	1.3		2.2		
RA_SE_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg			3.39	1.9 J		3.9 J		
RA_SE_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg			5.86	3.8		6.5		
RA_SE_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg			1.9	1.3		2.4		
RA_SE_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg			1.98	1.3		2.4		
RA_SE_SVOCs	Benzoic acid	65-85-0	mg/kg			2.39 U	0.68 UJ		0.66 UJ		
RA_SE_SVOCs	Benzyl Alcohol	100-51-6	mg/kg			0.239 U	0.54 U		0.53 U		
RA_SE_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg			0.324 J	0.27 U		0.16 J		
RA_SE_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Carbazole	86-74-8	mg/kg			0.602	0.36		0.52		
RA_SE_SVOCs	Chrysene	218-01-9	mg/kg			4.32	2.4		4.1		
RA_SE_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg			0.468	0.29		0.51		
RA_SE_SVOCs	Dibenzofuran	132-64-9	mg/kg			0.239 U	0.27 U		0.27 U		

ATTACHMENT A, TABLE A-5E
BACKGROUND SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SE-Background	SE-Background	SE-Background	SE-Background	SE-Background	SE-Background	SE-Background
				Location ID	Tidal Stream North	Tidal Stream North	Tidal Stream North	Tidal Stream North	Tidal Stream North	Tidal Stream North	Tidal Stream North
				Depth Interval	SED 1	SED 1	SED-101-2014	SED-321	SED-321	SED-322	SED-322
				Sample Type Code	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
				Sample ID	N	FD	N	N	N	N	N
				Sample Date	SED 1A 0-0.5	SED 1A 0-0.5DUP	SED-101-A-2014	SED-321-CI19-0-0.5	SED-321-CI20-0-0.5	SED-322-CI19-0-0.5	SED-322-CI20-0-0.5
					11/30/2011	11/30/2011	8/5/2014	10/1/2019	5/28/2020	10/1/2019	5/28/2020
Method Analyte Group	Compound	CAS #	Units								
RA_SE_SVOCs	Diethyl Phthalate	84-66-2	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Fluoranthene	206-44-0	mg/kg			8.47	4.4		7.2		
RA_SE_SVOCs	Fluorene	86-73-7	mg/kg			0.239 U	0.0540 J		0.0640 J		
RA_SE_SVOCs	Hexachlorobenzene	118-74-1	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Hexachlorobutadiene	87-68-3	mg/kg			0.239 U					
RA_SE_SVOCs	Hexachloroethane	67-72-1	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg			1.68	1.6		2.6		
RA_SE_SVOCs	Isophorone	78-59-1	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Naphthalene	91-20-3	mg/kg			0.239 U	0.0160 J		0.0170 J		
RA_SE_SVOCs	Nitrobenzene	98-95-3	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg			0.239 UJ	0.27 U		0.27 U		
RA_SE_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Pentachlorophenol	87-86-5	mg/kg			1.19 U	0.68 U		0.66 U		
RA_SE_SVOCs	Phenanthrene	85-01-8	mg/kg			2.35	1.7		2.3		
RA_SE_SVOCs	Phenol	108-95-2	mg/kg			0.239 U	0.27 U		0.27 U		
RA_SE_SVOCs	Pyrene	129-00-0	mg/kg			5.79	4.4 J		6.7 J		
RA_SE_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg			36	23		39		
RA_SE_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg			3.8	2.0		2.7		
RA_SE_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg			40	25		41		
RA_SE_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	0.0046 U		0.0019 U					
RA_SE_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,1-Dichloroethane	75-34-3	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,1-Dichloroethene	75-35-4	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,1-Dichloropropene	563-58-6	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,2-Dibromoethane	106-93-4	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,2-Dichloroethane	107-06-2	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,2-Dichloropropane	78-87-5	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,3-Dichloropropane	142-28-9	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	2,2-Dichloropropane	594-20-7	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	2-Butanone (MEK)	78-93-3	mg/kg	0.0457 U		0.0041 J					
RA_SE_VOCs	2-Chlorotoluene	95-49-8	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	2-Hexanone	591-78-6	mg/kg	0.0457 U		0.0095 U					

ATTACHMENT A, TABLE A-5E
BACKGROUND SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North
				Location ID	SED 1	SED 1	SED-101-2014	SED-321	SED-321	SED-322	SED-322
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
				Sample Type Code	N	FD	N	N	N	N	N
				Sample ID	SED 1A 0-0.5	SED 1A 0-0.5DUP	SED-101-A-2014	SED-321-CI19-0-0.5	SED-321-CI20-0-0.5	SED-322-CI19-0-0.5	SED-322-CI20-0-0.5
				Sample Date	11/30/2011	11/30/2011	8/5/2014	10/1/2019	5/28/2020	10/1/2019	5/28/2020
Method Analyte Group	Compound	CAS #	Units								
RA_SE_VOCs	4-Chlorotoluene	106-43-4	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	4-Isopropyltoluene	99-87-6	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg	0.0457 U		0.0095 U					
RA_SE_VOCs	Acetone	67-64-1	mg/kg	0.0457 U		0.0897					
RA_SE_VOCs	Benzene	71-43-2	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Bromobenzene	108-86-1	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Bromochloromethane	74-97-5	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Bromodichloromethane	75-27-4	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Bromoform	75-25-2	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Bromomethane	74-83-9	mg/kg	0.0091 U		0.0038 U					
RA_SE_VOCs	Carbon Disulfide	75-15-0	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Carbon Tetrachloride	56-23-5	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Chlorobenzene	108-90-7	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Chloroethane	75-00-3	mg/kg	0.0091 U		0.0038 U					
RA_SE_VOCs	Chloroform	67-66-3	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Chloromethane	74-87-3	mg/kg	0.0091 U		0.0038 U					
RA_SE_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	dibromochloromethane	124-48-1	mg/kg	0.0046 U		0.0019 U					
RA_SE_VOCs	Dibromomethane	74-95-3	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg	0.0091 U		0.0038 U					
RA_SE_VOCs	Ethylbenzene	100-41-4	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Hexachlorobutadiene	87-68-3	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Isopropylbenzene	98-82-8	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	M,P-Xylenes	179601-23-1	mg/kg	0.0091 U		0.0076 U					
RA_SE_VOCs	Methylene Chloride	75-09-2	mg/kg	0.0228 U		0.0038 U					
RA_SE_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Naphthalene	91-20-3	mg/kg	4.6 U		0.0038 U					
RA_SE_VOCs	n-Butylbenzene	104-51-8	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	n-Propylbenzene	103-65-1	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	O-Xylene	95-47-6	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	sec-Butylbenzene	135-98-8	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Styrene	100-42-5	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	tert-Butylbenzene	98-06-6	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Tetrachloroethene	127-18-4	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Toluene	108-88-3	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg	0.014 U		0.011 U					
RA_SE_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Trichloroethylene	79-01-6	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Trichlorofluoromethane	75-69-4	mg/kg	0.0046 U		0.0038 U					
RA_SE_VOCs	Vinyl Chloride	75-01-4	mg/kg	0.0091 U		0.0038 U					

Notes:
% = Percent.
B = Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.
AVS-SEM = Acid volatile sulfide and simultaneoulsy extracted metals.

ATTACHMENT A, TABLE A-5E
BACKGROUND SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North
			Location ID	SED 1	SED 1	SED-101-2014	SED-321	SED-321	SED-322	SED-322
			Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
			Sample Type Code	N	FD	N	N	N	N	N
			Sample ID	SED 1A 0-0.5	SED 1A 0-0.5DUP	SED-101-A-2014	SED-321-CI19-0-0.5	SED-321-CI20-0-0.5	SED-322-CI19-0-0.5	SED-322-CI20-0-0.5
			Sample Date	11/30/2011	11/30/2011	8/5/2014	10/1/2019	5/28/2020	10/1/2019	5/28/2020
Method Analyte Group	Compound	CAS #	Units							

CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SE = Sediment.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
UMOL/G = Micromole per gram.
VOC = Volatile organic compound.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-5E
BACKGROUND SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North
			Location ID	SED-322	SED-323	SED-323	SED-324	SED-324	SED-325	SED-325
			Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	N	0 - 0.5 ft	0 - 0.5 ft
			Sample Type Code	FD	N	N	N	N	N	N
			Sample ID	SED-322-CI19-0-0.5-DUP	SED-323-CI19-0-0.5	SED-323-CI20-0-0.5	SED-324-CI19-0-0.5	SED-324-CI20-0-0.5	SED-325-CI19-0-0.5	SED-325-CI20-0-0.5
			Sample Date	10/1/2019	10/1/2019	5/28/2020	10/1/2019	5/28/2020	10/1/2019	5/28/2020
Method Analyte Group	Compound	CAS #	Units							
RA_SE_AVS-SEM	ACID VOLATILE SULFIDE	18496-25-8	UMOL/G			0.13 U		0.12 U		0.095 U
RA_SE_AVS-SEM	Antimony	7440-36-0	UMOL/G			0.0013 U		0.0013 U		0.0011 U
RA_SE_AVS-SEM	Cadmium	7440-43-9	UMOL/G			0.000775 J		0.000390 J		0.000097 J
RA_SE_AVS-SEM	Chromium	7440-47-3	UMOL/G			0.0549		0.0440		0.00289 J
RA_SE_AVS-SEM	Copper	7440-50-8	UMOL/G			0.111		0.0431		0.0126
RA_SE_AVS-SEM	Lead	7439-92-1	UMOL/G			0.0905		0.0241		0.0196
RA_SE_AVS-SEM	Mercury	7439-97-6	UMOL/G			0.0000333 B		0.0000099 JB		0.0000103 JB
RA_SE_AVS-SEM	Nickel	7440-02-0	UMOL/G			0.0482		0.0306		0.00244 J
RA_SE_AVS-SEM	Silver	7440-22-4	UMOL/G			0.00077 J		0.00126 J		0.00093 U
RA_SE_AVS-SEM	Zinc	7440-66-6	UMOL/G			0.660		0.500		0.0500
RA_SE_Metals	Aluminum	7429-90-5	mg/kg	7470	7890		7420		5050	
RA_SE_Metals	Antimony	7440-36-0	mg/kg	0.131	0.150		0.140 J		0.0500 J	
RA_SE_Metals	Arsenic	7440-38-2	mg/kg	3.01	2.64		2.78		1.19	
RA_SE_Metals	Barium	7440-39-3	mg/kg	17.8	19.1		21.5		14.1	
RA_SE_Metals	Beryllium	7440-41-7	mg/kg	0.579	0.594		0.594		0.358	
RA_SE_Metals	Cadmium	7440-43-9	mg/kg	0.0604 J	0.0530 J		0.104 J		0.0250 J	
RA_SE_Metals	Calcium	7440-70-2	mg/kg	1030	1070		1160 J		499	
RA_SE_Metals	Chromium	7440-47-3	mg/kg	11.1	10.8		9.76		6.14	
RA_SE_Metals	Cobalt	7440-48-4	mg/kg	2.75	3.15		2.96		2.08	
RA_SE_Metals	Copper	7440-50-8	mg/kg	12.5	13.4		11.8		6.27	
RA_SE_Metals	Iron	7439-89-6	mg/kg	9130	9020		9420		9610	
RA_SE_Metals	Lead	7439-92-1	mg/kg	35.3	27.9		28.4 J		12.8	
RA_SE_Metals	Magnesium	7439-95-4	mg/kg	1660	1800		1530 J		1460	
RA_SE_Metals	Manganese	7439-96-5	mg/kg	98.2	106		122 J		75.2	
RA_SE_Metals	Mercury	7439-97-6	mg/kg	0.0430	0.0410 J		0.0380 J		0.0100 J	
RA_SE_Metals	Nickel	7440-02-0	mg/kg	6.90	7.30		7.06		4.16	
RA_SE_Metals	Potassium	7440-09-7	mg/kg	656	564		480		548	
RA_SE_Metals	Selenium	7782-49-2	mg/kg	0.210 J	0.220 J		0.280 J		0.0900 J	
RA_SE_Metals	Silver	7440-22-4	mg/kg	0.0558 J	0.0570 J		0.0490 J		0.0210 J	
RA_SE_Metals	Sodium	7440-23-5	mg/kg	129	104		50 U		30 U	
RA_SE_Metals	Thallium	7440-28-0	mg/kg	0.108	0.120		0.110 J		0.0751	
RA_SE_Metals	Vanadium	7440-62-2	mg/kg	12.6	14.2		13.5		8.90	
RA_SE_Metals	Zinc	7440-66-6	mg/kg	44.4	44.2		60.1 J		39.5	
RA_SE_Other	Total Organic Carbon	TOC	mg/kg		41000 J			41000	9400 J	
RA_SE_Other	Total Petroleum Hydrocarbons	TPH	mg/kg							
RA_SE_Other	TOTAL SOLIDS	SOLIDS	%			57		64		80
RA_SE_Pest_PCBs	Aroclor 1016	12674-11-2	mg/kg	0.0054 U	0.027 U		0.0053 U		0.0088 U	
RA_SE_Pest_PCBs	Aroclor 1221	11104-28-2	mg/kg	0.0054 U	0.027 U		0.0053 U		0.0088 U	
RA_SE_Pest_PCBs	Aroclor 1232	11141-16-5	mg/kg	0.0063 U	0.032 U		0.0063 U		0.01 U	
RA_SE_Pest_PCBs	Aroclor 1242	53469-21-9	mg/kg	0.0054 U	0.027 U		0.0053 U		0.0088 U	
RA_SE_Pest_PCBs	Aroclor 1248	12672-29-6	mg/kg	0.0054 U	0.027 U		0.0053 U		0.0088 U	
RA_SE_Pest_PCBs	Aroclor 1254	11097-69-1	mg/kg	0.0054 U	0.027 U		0.0053 U		0.0088 U	
RA_SE_Pest_PCBs	Aroclor 1260	11096-82-5	mg/kg	0.0280 J	0.027 U		0.0053 U		0.0088 U	
RA_SE_Pest_PCBs	Aroclor 1262	37324-23-5	mg/kg							
RA_SE_Pest_PCBs	Aroclor 1268	11100-14-4	mg/kg							
RA_SE_Pest_PCBs	PCB, Total (a)	1336-36-3	mg/kg	0.0280 J	0.2 U		0.038 U		0.063 U	
RA_SE_Pest_PCBs	Total PCB Aroclors (b)	Tot-PCB-ARO	mg/kg	0.061	0.19 U		0.038 U		0.063 U	

ATTACHMENT A, TABLE A-5E
BACKGROUND SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North
				Location ID	SED-322	SED-323	SED-323	SED-324	SED-324	SED-325	SED-325
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
				Sample Type Code	FD	N	N	N	N	N	N
				Sample ID	SED-322-CI19-0-0.5-DUP	SED-323-CI19-0-0.5	SED-323-CI20-0-0.5	SED-324-CI19-0-0.5	SED-324-CI20-0-0.5	SED-325-CI19-0-0.5	SED-325-CI20-0-0.5
				Sample Date	10/1/2019	10/1/2019	5/28/2020	10/1/2019	5/28/2020	10/1/2019	5/28/2020
Method Analyte Group	Compound	CAS #	Units								
RA_SE_SVOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	1,2-Dichlorobenzene	95-50-1	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	1,3-Dichlorobenzene	541-73-1	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	1,4-Dichlorobenzene	106-46-7	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	1-Methylnaphthalene	90-12-0	mg/kg	0.064 U	0.067 U		0.00360 J		0.012 U	
RA_SE_SVOCs	2,4,5-Trichlorophenol	95-95-4	mg/kg	0.79 U	0.82 U		0.79 U		0.71 U	
RA_SE_SVOCs	2,4,6-Trichlorophenol	88-06-2	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	2,4-Dichlorophenol	120-83-2	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	2,4-Dimethylphenol	105-67-9	mg/kg	0.32 U	0.33 U		0.32 UJ		0.28 U	
RA_SE_SVOCs	2,4-Dinitrophenol	51-28-5	mg/kg	0.79 U	0.82 U		0.79 U		0.71 U	
RA_SE_SVOCs	2,4-Dinitrotoluene	121-14-2	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	2,6-Dinitrotoluene	606-20-2	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	2-Chloronaphthalene	91-58-7	mg/kg	0.32 UJ	0.33 UJ		0.32 UJ		0.28 UJ	
RA_SE_SVOCs	2-Chlorophenol	95-57-8	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	2-Methylnaphthalene	91-57-6	mg/kg	0.064 U	0.067 U		0.00400 J		0.012 U	
RA_SE_SVOCs	2-Methylphenol	95-48-7	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	2-Nitroaniline	88-74-4	mg/kg	0.79 U	0.82 U		0.79 U		0.71 U	
RA_SE_SVOCs	2-Nitrophenol	88-75-5	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	3&4-Methylphenol	3&4-Mphenol	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	3,3'-Dichlorobenzidine	91-94-1	mg/kg	0.32 UJ	0.33 UJ				0.28 UJ	
RA_SE_SVOCs	3-Nitroaniline	99-09-2	mg/kg	0.79 U	0.82 U		0.79 U		0.71 U	
RA_SE_SVOCs	4,6-Dinitro-2-Methylphenol	534-52-1	mg/kg	0.79 U	0.82 U		0.79 U		0.71 U	
RA_SE_SVOCs	4-Bromophenyl-Phenylether	101-55-3	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	4-Chloro-3-Methylphenol	59-50-7	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	4-Chloroaniline	106-47-8	mg/kg	0.32 U	0.33 U		0.32 UJ		0.28 U	
RA_SE_SVOCs	4-Chlorophenyl-Phenylether	7005-72-3	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	4-Nitroaniline	100-01-6	mg/kg	0.79 U	0.82 U		0.79 UJ		0.71 U	
RA_SE_SVOCs	4-Nitrophenol	100-02-7	mg/kg	0.79 U	0.82 U		0.79 U		0.71 U	
RA_SE_SVOCs	Acenaphthene	83-32-9	mg/kg	0.0340 J	0.0320 J		0.0180 J		0.012 U	
RA_SE_SVOCs	Acenaphthylene	208-96-8	mg/kg	0.064 U	0.067 U		0.00370 J		0.012 U	
RA_SE_SVOCs	Anthracene	120-12-7	mg/kg	0.18 J	0.16 J		0.0550 J		0.00880 J	
RA_SE_SVOCs	Benzo(a)anthracene	56-55-3	mg/kg	2.3	2.3		1.1 J		0.12	
RA_SE_SVOCs	Benzo(a)Pyrene	50-32-8	mg/kg	3.9 J	4.3 J		1.9 J		0.2 J	
RA_SE_SVOCs	Benzo(b)fluoranthene	205-99-2	mg/kg	6.6	7.2		4.9 J		0.38	
RA_SE_SVOCs	Benzo(g,h,i)Perylene	191-24-2	mg/kg	2.6	3		2.1 J		0.17	
RA_SE_SVOCs	Benzo(k)Fluoranthene	207-08-9	mg/kg	2.6	2.6		1.3 J		0.13	
RA_SE_SVOCs	Benzoic acid	65-85-0	mg/kg	0.79 UJ	0.82 UJ		0.79 UJ		0.71 UJ	
RA_SE_SVOCs	Benzyl Alcohol	100-51-6	mg/kg	0.64 U	0.66 U		0.63 U		0.57 U	
RA_SE_SVOCs	Bis-(2-Chloroethoxy)-Methane	111-91-1	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	Bis-(2-Chloroethyl)-Ether	111-44-4	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	Bis-(2-Chloroisopropyl)- Ether	108-60-1	mg/kg	0.32 U	0.33 U		0.32 UJ		0.28 U	
RA_SE_SVOCs	Bis-(2-Ethylhexyl)-Phthalate	117-81-7	mg/kg	0.28 J	0.16 J				0.28 U	
RA_SE_SVOCs	Butyl Benzyl Phthalate	85-68-7	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	Carbazole	86-74-8	mg/kg	0.57	0.62		0.24 J		0.28 U	
RA_SE_SVOCs	Chrysene	218-01-9	mg/kg	4.4	4.7		2.5 J		0.24	
RA_SE_SVOCs	Dibenzo(a,h)Anthracene	53-70-3	mg/kg	0.56	0.66		0.22 J		0.0420	
RA_SE_SVOCs	Dibenzofuran	132-64-9	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	

ATTACHMENT A, TABLE A-5E
BACKGROUND SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North
				Location ID	SED-322	SED-323	SED-323	SED-324	SED-324	SED-325	SED-325
				Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
				Sample Type Code	FD	N	N	N	N	N	N
				Sample ID	SED-322-CI19-0-0.5-DUP	SED-323-CI19-0-0.5	SED-323-CI20-0-0.5	SED-324-CI19-0-0.5	SED-324-CI20-0-0.5	SED-325-CI19-0-0.5	SED-325-CI20-0-0.5
				Sample Date	10/1/2019	10/1/2019	5/28/2020	10/1/2019	5/28/2020	10/1/2019	5/28/2020
Method Analyte Group	Compound	CAS #	Units								
RA_SE_SVOCs	Diethyl Phthalate	84-66-2	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	Dimethyl Phthalate	131-11-3	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	Di-n-Butyl Phthalate	84-74-2	mg/kg	0.32 U	0.33 U		0.32 UJ		0.28 U	
RA_SE_SVOCs	Di-n-Octyl Phthalate	117-84-0	mg/kg	0.32 U	0.33 U				0.28 U	
RA_SE_SVOCs	Fluoranthene	206-44-0	mg/kg	7	7.7		3.8 J		0.37	
RA_SE_SVOCs	Fluorene	86-73-7	mg/kg	0.0640 J	0.0570 J		0.0320 J		0.00410 J	
RA_SE_SVOCs	Hexachlorobenzene	118-74-1	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	Hexachlorobutadiene	87-68-3	mg/kg							
RA_SE_SVOCs	Hexachloroethane	67-72-1	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	Indeno(1,2,3-CD)Pyrene	193-39-5	mg/kg	3.1	4.4		2.7 J		0.24	
RA_SE_SVOCs	Isophorone	78-59-1	mg/kg	0.32 U	0.33 U				0.28 U	
RA_SE_SVOCs	Naphthalene	91-20-3	mg/kg	0.064 U	0.067 U		0.013 U		0.012 U	
RA_SE_SVOCs	Nitrobenzene	98-95-3	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	n-Nitroso-Di-Methylamine	62-75-9	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	n-Nitroso-Di-n-Propylamine	621-64-7	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	n-Nitroso-Di-Phenylamine	86-30-6	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	Pentachlorophenol	87-86-5	mg/kg	0.79 U	0.82 U		0.79 U		0.71 U	
RA_SE_SVOCs	Phenanthrene	85-01-8	mg/kg	2.5	2.3		1 J		0.15	
RA_SE_SVOCs	Phenol	108-95-2	mg/kg	0.32 U	0.33 U		0.32 U		0.28 U	
RA_SE_SVOCs	Pyrene	129-00-0	mg/kg	6.3 J	8.2 J		3.6 J		0.38 J	
RA_SE_SVOCs	Total High MW PAHs (b)	Tot-HMW-PAH	mg/kg	39	45		24		2.3	
RA_SE_SVOCs	Total Low MW PAHs (b)	Tot-LMW-PAH	mg/kg	2.9	2.7		1.1		0.20	
RA_SE_SVOCs	Total PAHs (b)	Tot-PAH	mg/kg	42	48		25		2.5	
RA_SE_VOCs	1,1,1,2-Tetrachloroethane	630-20-6	mg/kg							
RA_SE_VOCs	1,1,1-Trichloroethane	71-55-6	mg/kg							
RA_SE_VOCs	1,1,2,2-Tetrachloroethane	79-34-5	mg/kg							
RA_SE_VOCs	1,1,2-Trichloroethane	79-00-5	mg/kg							
RA_SE_VOCs	1,1-Dichloroethane	75-34-3	mg/kg							
RA_SE_VOCs	1,1-Dichloroethene	75-35-4	mg/kg							
RA_SE_VOCs	1,1-Dichloropropene	563-58-6	mg/kg							
RA_SE_VOCs	1,2,3-Trichlorobenzene	87-61-6	mg/kg							
RA_SE_VOCs	1,2,3-Trichloropropane	96-18-4	mg/kg							
RA_SE_VOCs	1,2,4-Trichlorobenzene	120-82-1	mg/kg							
RA_SE_VOCs	1,2,4-Trimethylbenzene	95-63-6	mg/kg							
RA_SE_VOCs	1,2-Dibromo-3-Chloropropane	96-12-8	mg/kg							
RA_SE_VOCs	1,2-Dibromoethane	106-93-4	mg/kg							
RA_SE_VOCs	1,2-Dichlorobenzene	95-50-1	mg/kg							
RA_SE_VOCs	1,2-Dichloroethane	107-06-2	mg/kg							
RA_SE_VOCs	1,2-Dichloropropane	78-87-5	mg/kg							
RA_SE_VOCs	1,3,5-Trimethylbenzene	108-67-8	mg/kg							
RA_SE_VOCs	1,3-Dichlorobenzene	541-73-1	mg/kg							
RA_SE_VOCs	1,3-Dichloropropane	142-28-9	mg/kg							
RA_SE_VOCs	1,4-Dichlorobenzene	106-46-7	mg/kg							
RA_SE_VOCs	2,2-Dichloropropane	594-20-7	mg/kg							
RA_SE_VOCs	2-Butanone (MEK)	78-93-3	mg/kg							
RA_SE_VOCs	2-Chlorotoluene	95-49-8	mg/kg							
RA_SE_VOCs	2-Hexanone	591-78-6	mg/kg							

ATTACHMENT A, TABLE A-5E
BACKGROUND SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North
			Location ID	SED-322	SED-323	SED-323	SED-324	SED-324	SED-325	SED-325
			Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
			Sample Type Code	FD	N	N	N	N	N	N
			Sample ID	SED-322-CI19-0-0.5-DUP	SED-323-CI19-0-0.5	SED-323-CI20-0-0.5	SED-324-CI19-0-0.5	SED-324-CI20-0-0.5	SED-325-CI19-0-0.5	SED-325-CI20-0-0.5
			Sample Date	10/1/2019	10/1/2019	5/28/2020	10/1/2019	5/28/2020	10/1/2019	5/28/2020
Method Analyte Group	Compound	CAS #	Units							
RA_SE_VOCs	4-Chlorotoluene	106-43-4	mg/kg							
RA_SE_VOCs	4-Isopropyltoluene	99-87-6	mg/kg							
RA_SE_VOCs	4-Methyl-2-pentanone	108-10-1	mg/kg							
RA_SE_VOCs	Acetone	67-64-1	mg/kg							
RA_SE_VOCs	Benzene	71-43-2	mg/kg							
RA_SE_VOCs	Bromobenzene	108-86-1	mg/kg							
RA_SE_VOCs	Bromochloromethane	74-97-5	mg/kg							
RA_SE_VOCs	Bromodichloromethane	75-27-4	mg/kg							
RA_SE_VOCs	Bromoform	75-25-2	mg/kg							
RA_SE_VOCs	Bromomethane	74-83-9	mg/kg							
RA_SE_VOCs	Carbon Disulfide	75-15-0	mg/kg							
RA_SE_VOCs	Carbon Tetrachloride	56-23-5	mg/kg							
RA_SE_VOCs	Chlorobenzene	108-90-7	mg/kg							
RA_SE_VOCs	Chloroethane	75-00-3	mg/kg							
RA_SE_VOCs	Chloroform	67-66-3	mg/kg							
RA_SE_VOCs	Chloromethane	74-87-3	mg/kg							
RA_SE_VOCs	cis-1,2-Dichloroethene	156-59-2	mg/kg							
RA_SE_VOCs	cis-1,3-Dichloropropene	10061-01-5	mg/kg							
RA_SE_VOCs	dibromochloromethane	124-48-1	mg/kg							
RA_SE_VOCs	Dibromomethane	74-95-3	mg/kg							
RA_SE_VOCs	Dichlorodifluoromethane	75-71-8	mg/kg							
RA_SE_VOCs	Ethylbenzene	100-41-4	mg/kg							
RA_SE_VOCs	Hexachlorobutadiene	87-68-3	mg/kg							
RA_SE_VOCs	Isopropylbenzene	98-82-8	mg/kg							
RA_SE_VOCs	M,P-Xylenes	179601-23-1	mg/kg							
RA_SE_VOCs	Methylene Chloride	75-09-2	mg/kg							
RA_SE_VOCs	Methyl-t-butyl ether (MTBE)	1634-04-4	mg/kg							
RA_SE_VOCs	Naphthalene	91-20-3	mg/kg							
RA_SE_VOCs	n-Butylbenzene	104-51-8	mg/kg							
RA_SE_VOCs	n-Propylbenzene	103-65-1	mg/kg							
RA_SE_VOCs	O-Xylene	95-47-6	mg/kg							
RA_SE_VOCs	sec-Butylbenzene	135-98-8	mg/kg							
RA_SE_VOCs	Styrene	100-42-5	mg/kg							
RA_SE_VOCs	tert-Butylbenzene	98-06-6	mg/kg							
RA_SE_VOCs	Tetrachloroethene	127-18-4	mg/kg							
RA_SE_VOCs	Toluene	108-88-3	mg/kg							
RA_SE_VOCs	Total Xylenes (b)	Tot-Xylenes	mg/kg							
RA_SE_VOCs	trans-1,2-Dichloroethene	156-60-5	mg/kg							
RA_SE_VOCs	trans-1,3-Dichloropropene	10061-02-6	mg/kg							
RA_SE_VOCs	Trichloroethylene	79-01-6	mg/kg							
RA_SE_VOCs	Trichlorofluoromethane	75-69-4	mg/kg							
RA_SE_VOCs	Vinyl Chloride	75-01-4	mg/kg							

Notes:
% = Percent.
B = Indicates the analyte was detected in the laboratory method blank analyzed concurrently with the sample.
AVS-SEM = Acid volatile sulfide and simultaneoulsy extracted metals.

ATTACHMENT A, TABLE A-5E
BACKGROUND SEDIMENT ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North	SE-Background Tidal Stream North
			Location ID	SED-322	SED-323	SED-323	SED-324	SED-324	SED-325	SED-325
			Depth Interval	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
			Sample Type Code	FD	N	N	N	N	N	N
			Sample ID	SED-322-CI19-0-0.5-DUP	SED-323-CI19-0-0.5	SED-323-CI20-0-0.5	SED-324-CI19-0-0.5	SED-324-CI20-0-0.5	SED-325-CI19-0-0.5	SED-325-CI20-0-0.5
			Sample Date	10/1/2019	10/1/2019	5/28/2020	10/1/2019	5/28/2020	10/1/2019	5/28/2020
Method Analyte Group	Compound	CAS #	Units							

CAS = Chemical Abstracts Service.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
mg/kg = Milligrams per kilogram.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
SE = Sediment.
SVOC = Semivolatile organic compound.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
UMOL/G = Micromole per gram.
VOC = Volatile organic compound.
(a) Lab calculated value; not utilized in the risk assessment.
(b) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-6A
SURFACE WATER SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area	Location ID	Sample Date	Sample ID	Sample Type	Parent Sample ID	Depth Interval
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-103-2014	7/31/2014	SW-103-A	N		0.5 - 0.5 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-103-2014	7/31/2014	SW-103-A-F	N		0.5 - 0.5 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-103-2014	7/31/2014	SW-103-AM	N		0.5 - 0.5 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-104-2014	7/31/2014	SW-104-A	N		0.2 - 0.2 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-104-2014	7/31/2014	SW-104-A-F	N		0.2 - 0.2 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-104-2014	7/31/2014	SW-104-AM	N		0.2 - 0.2 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-105-2014	7/31/2014	SW-105-A	N		0.7 - 0.7 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-105-2014	7/31/2014	SW-105-A-F	N		0.7 - 0.7 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-105-2014	7/31/2014	SW-105-AM	N		0.7 - 0.7 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-1A	11/30/2011	SW-1A - 11-30-2011	N		0.25 - 0.25 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-1A	11/30/2011	SW-1AF - 11-30-2011	N		0.25 - 0.25 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-1A	11/30/2011	SW-1AFDUP - 11-30-2011	FD	SW-1AF - 11-30-2011	0.25 - 0.25 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-3A	11/30/2011	SW-3A - 11-30-2011	N		0.5 - 0.5 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-3A	11/30/2011	SW-3AF - 11-30-2011	N		0.5 - 0.5 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-3A	11/30/2011	SW-3AD - 11-30-2011	FD	SW-3A - 11-30-2011	0.5 - 0.5 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-3A	11/30/2011	SW-3ADF - 11-30-2011	FD	SW-3AF - 11-30-2011	0.5 - 0.5 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-4A	11/29/2011	SW-4A - 11-29-2011	N		0.15 - 0.15 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-4A	11/29/2011	SW-4A F - 11-29-2011	N		0.15 - 0.15 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-4A	11/29/2011	SW-4ADUP - 11-29-2011	FD	SW-4A - 11-29-2011	0.15 - 0.15 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-5A	11/29/2011	SW-5A - 11-29-2011	N		0.35 - 0.35 ft
WS	Off-Project Red Maple Swamp /Tidal Marsh	SW-5A	11/29/2011	SW-5A F - 11-29-2011	N		0.35 - 0.35 ft
WS	Off-Project Narragansett Bay and Beachfront	SW-1-090115	9/1/2015	SW-1-090115	N		0.5 - 0.5 ft
WS	Off-Project Narragansett Bay and Beachfront	SW-1-090115	9/1/2015	SW-1F-090115	N		0.5 - 0.5 ft
WS	Off-Project Narragansett Bay and Beachfront	SW-2-090115	9/1/2015	SW-2-090115	N		0.6 - 0.6 ft
WS	Off-Project Narragansett Bay and Beachfront	SW-2-090115	9/1/2015	SW-2F-090115	N		0.6 - 0.6 ft
WS	Off-Project Narragansett Bay and Beachfront	SW-3-090115	9/1/2015	SW-3-090115	N		0.5 - 0.5 ft
WS	Off-Project Narragansett Bay and Beachfront	SW-3-090115	9/1/2015	SW-3F-090115	N		0.5 - 0.5 ft
WS	Off-Project Narragansett Bay and Beachfront	SW-3-090115	9/1/2015	SW-3X-090115	FD	SW-3-090115	0.5 - 0.5 ft
WS	Off-Project Narragansett Bay and Beachfront	SW-3-090115	9/1/2015	SW-3XF-090115	FD	SW-3F-090115	0.5 - 0.5 ft

Notes:
FD - Field duplicate.
ft - Feet.
N - Normal sample.
WS - Surface Water.

ATTACHMENT A, TABLE A-6B
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location Group					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location ID					SW-1-090115	SW-1-090115	SW-2-090115	SW-2-090115	SW-3-090115	SW-3-090115
Sample Type Code					N	N	N	N	N	FD
Sample ID					SW-1-090115	SW-1F-090115	SW-2-090115	SW-2F-090115	SW-3-090115	SW-3X-090115
Sample Date					9/1/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015
Depth Interval					0.5 - 0.5 ft	0.5 - 0.5 ft	0.6 - 0.6 ft	0.6 - 0.6 ft	0.5 - 0.5 ft	0.5 - 0.5 ft
Method Analyte Group	Fraction	Compound	CAS #	Units						
RA WS Metals	D	Arsenic	7440-38-2	ug/l		4 U		10 U		
RA WS Metals	D	Barium	7440-39-3	ug/l		25 U		25 U		
RA WS Metals	D	Cadmium	7440-43-9	ug/l		4 U		10 U		
RA WS Metals	D	Chromium	7440-47-3	ug/l		25 U		25 U		
RA WS Metals	D	HEXAVALENT CHROMIUM	18540-29-9	ug/l		2.1 U		2.1 U		
RA WS Metals	D	Lead	7439-92-1	ug/l		13 U		13 U		
RA WS Metals	D	Mercury	7439-97-6	ug/l		0.15 U		0.15 U		
RA WS Metals	D	Selenium	7782-49-2	ug/l		10 U		25 U		
RA WS Metals	D	Silver	7440-22-4	ug/l		13 U		13 U		
RA WS Metals	T	Arsenic	7440-38-2	ug/l	4 U		4 U		10 U	4 U
RA WS Metals	T	Barium	7440-39-3	ug/l	25 U		25 U		25 U	25 U
RA WS Metals	T	Cadmium	7440-43-9	ug/l	4 U		4 U		10 U	4 U
RA WS Metals	T	Chromium	7440-47-3	ug/l	25 U		25 U		25 U	25 U
RA WS Metals	T	HEXAVALENT CHROMIUM	18540-29-9	ug/l	2.1 U		2.1 U		2.1 U	2.1 U
RA WS Metals	T	Lead	7439-92-1	ug/l	13 U		13 U		13 U	13 U
RA WS Metals	T	Mercury	7439-97-6	ug/l	0.15 U		0.15 U		0.15 U	0.15 U
RA WS Metals	T	Selenium	7782-49-2	ug/l	10 U		10 U		25 U	10 U
RA WS Metals	T	Silver	7440-22-4	ug/l	13 U		13 U		13 U	13 U
RA WS Other	T	HARDNESS (AS CACO3)	HARD	ug/l	5750000		5500000		5750000	5500000
RA WS VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,1-Dichloroethane	75-34-3	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,1-Dichloroethene	75-35-4	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,1-Dichloropropene	563-58-6	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l	20 U		20 U		20 U	20 U
RA WS VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l	10 U		10 U		10 U	10 U
RA WS VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l	10 U		10 U		10 U	10 U
RA WS VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	10 U		10 U		10 U	10 U
RA WS VOCs	T	1,2-Dibromoethane	106-93-4	ug/l	10 U		10 U		10 U	10 U
RA WS VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,2-Dichloroethane	107-06-2	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,2-Dichloropropane	78-87-5	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	1,3-Dichloropropane	142-28-9	ug/l	10 U		10 U		10 U	10 U
RA WS VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	2,2-Dichloropropane	594-20-7	ug/l	20 U		20 U		20 U	20 U
RA WS VOCs	T	2-Butanone (MEK)	78-93-3	ug/l	50 U		50 U		50 U	50 U
RA WS VOCs	T	2-Chlorotoluene	95-49-8	ug/l	10 U		10 U		10 U	10 U
RA WS VOCs	T	2-Hexanone	591-78-6	ug/l	50 U		50 U		50 U	50 U
RA WS VOCs	T	4-Chlorotoluene	106-43-4	ug/l	10 U		10 U		10 U	10 U
RA WS VOCs	T	4-Isopropyltoluene	99-87-6	ug/l	10 U		10 U		10 U	10 U
RA WS VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l	20 U		20 U		20 U	20 U
RA WS VOCs	T	Acetone	67-64-1	ug/l	50 U		50 U		50 U	50 U
RA WS VOCs	T	Benzene	71-43-2	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	Bromobenzene	108-86-1	ug/l	10 U		10 U		10 U	10 U
RA WS VOCs	T	Bromochloromethane	74-97-5	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	Bromodichloromethane	75-27-4	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	Bromoform	75-25-2	ug/l	5 U		5 U		5 U	5 U
RA WS VOCs	T	Bromomethane	74-83-9	ug/l	10 U		10 U		10 U	10 U

ATTACHMENT A, TABLE A-6B
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location Group					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
Location ID					SW-1-090115	SW-1-090115	SW-2-090115	SW-2-090115	SW-3-090115	SW-3-090115
Sample Type Code					N	N	N	N	N	FD
Sample ID					SW-1-090115	SW-1F-090115	SW-2-090115	SW-2F-090115	SW-3-090115	SW-3X-090115
Sample Date					9/1/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015	9/1/2015
Depth Interval					0.5 - 0.5 ft	0.5 - 0.5 ft	0.6 - 0.6 ft	0.6 - 0.6 ft	0.5 - 0.5 ft	0.5 - 0.5 ft
Method Analyte Group	Fraction	Compound	CAS #	Units						
RA_WS_VOCs	T	Carbon Disulfide	75-15-0	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	Carbon Tetrachloride	56-23-5	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	Chlorobenzene	108-90-7	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	Chloroethane	75-00-3	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	Chloroform	67-66-3	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	Chloromethane	74-87-3	ug/l	10 U		10 U		10 U	10 U
RA_WS_VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	dibromochloromethane	124-48-1	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	Dibromomethane	74-95-3	ug/l	10 U		10 U		10 U	10 U
RA_WS_VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l	10 U		10 U		10 U	10 U
RA_WS_VOCs	T	Ethylbenzene	100-41-4	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	Hexachlorobutadiene	87-68-3	ug/l	10 U		10 U		10 U	10 U
RA_WS_VOCs	T	Isopropylbenzene	98-82-8	ug/l	10 U		10 U		10 U	10 U
RA_WS_VOCs	T	M,P-Xylenes	179601-23-1	ug/l	10 U		10 U		10 U	10 U
RA_WS_VOCs	T	Methylene Chloride	75-09-2	ug/l	10 U		10 U		10 U	10 U
RA_WS_VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	Naphthalene	91-20-3	ug/l	20 U		20 U		20 U	20 U
RA_WS_VOCs	T	n-Butylbenzene	104-51-8	ug/l	10 U		10 U		10 U	10 U
RA_WS_VOCs	T	n-Propylbenzene	103-65-1	ug/l	10 U		10 U		10 U	10 U
RA_WS_VOCs	T	O-Xylene	95-47-6	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	sec-Butylbenzene	135-98-8	ug/l	10 U		10 U		10 U	10 U
RA_WS_VOCs	T	Styrene	100-42-5	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	tert-Butylbenzene	98-06-6	ug/l	10 U		10 U		10 U	10 U
RA_WS_VOCs	T	Tetrachloroethene	127-18-4	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	Toluene	108-88-3	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l	15 U		15 U		15 U	15 U
RA_WS_VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	Trichloroethylene	79-01-6	ug/l	5 U		5 U		5 U	5 U
RA_WS_VOCs	T	Trichlorofluoromethane	75-69-4	ug/l	10 U		10 U		10 U	10 U
RA_WS_VOCs	T	Vinyl Chloride	75-01-4	ug/l	5 U		5 U		5 U	5 U

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-6B
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
		Location Group			Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
		Location ID			SW-3-090115	SW-3-090115
		Sample Type Code			N	FD
		Sample ID			SW-3F-090115	SW-3XF-090115
		Sample Date			9/1/2015	9/1/2015
		Depth Interval			0.5 - 0.5 ft	0.5 - 0.5 ft
Method Analyte Group	Fraction	Compound	CAS #	Units		
RA WS Metals	D	Arsenic	7440-38-2	ug/l	10 U	10 U
RA WS Metals	D	Barium	7440-39-3	ug/l	25 U	25 U
RA WS Metals	D	Cadmium	7440-43-9	ug/l	10 U	10 U
RA WS Metals	D	Chromium	7440-47-3	ug/l	25 U	25 U
RA WS Metals	D	HEXAVALENT CHROMIUM	18540-29-9	ug/l	2.1 U	2.1 U
RA WS Metals	D	Lead	7439-92-1	ug/l	13 U	13 U
RA WS Metals	D	Mercury	7439-97-6	ug/l	0.15 U	0.15 U
RA WS Metals	D	Selenium	7782-49-2	ug/l	25 U	25 U
RA WS Metals	D	Silver	7440-22-4	ug/l	13 U	13 U
RA WS Metals	T	Arsenic	7440-38-2	ug/l		
RA WS Metals	T	Barium	7440-39-3	ug/l		
RA WS Metals	T	Cadmium	7440-43-9	ug/l		
RA WS Metals	T	Chromium	7440-47-3	ug/l		
RA WS Metals	T	HEXAVALENT CHROMIUM	18540-29-9	ug/l		
RA WS Metals	T	Lead	7439-92-1	ug/l		
RA WS Metals	T	Mercury	7439-97-6	ug/l		
RA WS Metals	T	Selenium	7782-49-2	ug/l		
RA WS Metals	T	Silver	7440-22-4	ug/l		
RA WS Other	T	HARDNESS (AS CACO3)	HARD	ug/l		
RA WS VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l		
RA WS VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l		
RA WS VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l		
RA WS VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l		
RA WS VOCs	T	1,1-Dichloroethane	75-34-3	ug/l		
RA WS VOCs	T	1,1-Dichloroethene	75-35-4	ug/l		
RA WS VOCs	T	1,1-Dichloropropene	563-58-6	ug/l		
RA WS VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l		
RA WS VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l		
RA WS VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l		
RA WS VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l		
RA WS VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l		
RA WS VOCs	T	1,2-Dibromoethane	106-93-4	ug/l		
RA WS VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l		
RA WS VOCs	T	1,2-Dichloroethane	107-06-2	ug/l		
RA WS VOCs	T	1,2-Dichloropropane	78-87-5	ug/l		
RA WS VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l		
RA WS VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l		
RA WS VOCs	T	1,3-Dichloropropane	142-28-9	ug/l		
RA WS VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l		
RA WS VOCs	T	2,2-Dichloropropane	594-20-7	ug/l		
RA WS VOCs	T	2-Butanone (MEK)	78-93-3	ug/l		
RA WS VOCs	T	2-Chlorotoluene	95-49-8	ug/l		
RA WS VOCs	T	2-Hexanone	591-78-6	ug/l		
RA WS VOCs	T	4-Chlorotoluene	106-43-4	ug/l		
RA WS VOCs	T	4-Isopropyltoluene	99-87-6	ug/l		
RA WS VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l		
RA WS VOCs	T	Acetone	67-64-1	ug/l		
RA WS VOCs	T	Benzene	71-43-2	ug/l		
RA WS VOCs	T	Bromobenzene	108-86-1	ug/l		
RA WS VOCs	T	Bromochloromethane	74-97-5	ug/l		
RA WS VOCs	T	Bromodichloromethane	75-27-4	ug/l		
RA WS VOCs	T	Bromoform	75-25-2	ug/l		
RA WS VOCs	T	Bromomethane	74-83-9	ug/l		

ATTACHMENT A, TABLE A-6B
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
			Location Group		Off-Project Narragansett Bay and Beachfront Area	Off-Project Narragansett Bay and Beachfront Area
			Location ID		SW-3-090115	SW-3-090115
			Sample Type Code		N	FD
			Sample ID		SW-3F-090115	SW-3XF-090115
			Sample Date		9/1/2015	9/1/2015
			Depth Interval		0.5 - 0.5 ft	0.5 - 0.5 ft
Method Analyte Group	Fraction	Compound	CAS #	Units		
RA_WS_VOCs	T	Carbon Disulfide	75-15-0	ug/l		
RA_WS_VOCs	T	Carbon Tetrachloride	56-23-5	ug/l		
RA_WS_VOCs	T	Chlorobenzene	108-90-7	ug/l		
RA_WS_VOCs	T	Chloroethane	75-00-3	ug/l		
RA_WS_VOCs	T	Chloroform	67-66-3	ug/l		
RA_WS_VOCs	T	Chloromethane	74-87-3	ug/l		
RA_WS_VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l		
RA_WS_VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l		
RA_WS_VOCs	T	dibromochloromethane	124-48-1	ug/l		
RA_WS_VOCs	T	Dibromomethane	74-95-3	ug/l		
RA_WS_VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l		
RA_WS_VOCs	T	Ethylbenzene	100-41-4	ug/l		
RA_WS_VOCs	T	Hexachlorobutadiene	87-68-3	ug/l		
RA_WS_VOCs	T	Isopropylbenzene	98-82-8	ug/l		
RA_WS_VOCs	T	M,P-Xylenes	179601-23-1	ug/l		
RA_WS_VOCs	T	Methylene Chloride	75-09-2	ug/l		
RA_WS_VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l		
RA_WS_VOCs	T	Naphthalene	91-20-3	ug/l		
RA_WS_VOCs	T	n-Butylbenzene	104-51-8	ug/l		
RA_WS_VOCs	T	n-Propylbenzene	103-65-1	ug/l		
RA_WS_VOCs	T	O-Xylene	95-47-6	ug/l		
RA_WS_VOCs	T	sec-Butylbenzene	135-98-8	ug/l		
RA_WS_VOCs	T	Styrene	100-42-5	ug/l		
RA_WS_VOCs	T	tert-Butylbenzene	98-06-6	ug/l		
RA_WS_VOCs	T	Tetrachloroethene	127-18-4	ug/l		
RA_WS_VOCs	T	Toluene	108-88-3	ug/l		
RA_WS_VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l		
RA_WS_VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l		
RA_WS_VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l		
RA_WS_VOCs	T	Trichloroethylene	79-01-6	ug/l		
RA_WS_VOCs	T	Trichlorofluoromethane	75-69-4	ug/l		
RA_WS_VOCs	T	Vinyl Chloride	75-01-4	ug/l		

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-6C
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	SW-103-2014	SW-103-2014	SW-103-2014	SW-104-2014	SW-104-2014	SW-104-2014	SW-105-2014
					Sample Type Code	N	N	N	N	N	N	N
					Sample ID	SW-103-A	SW-103-A-F	SW-103-AM	SW-104-A	SW-104-A-F	SW-104-AM	SW-105-A
					Sample Date	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014
					Depth Interval	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.2 - 0.2 ft	0.2 - 0.2 ft	0.2 - 0.2 ft	0.7 - 0.7 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA WS Metals	D	Arsenic	7440-38-2	ug/l		1 U				1 U		
RA WS Metals	D	Barium	7440-39-3	ug/l		14.5 J				16.2 J		
RA WS Metals	D	Cadmium	7440-43-9	ug/l		0.05 J				0.05 J		
RA WS Metals	D	Chromium	7440-47-3	ug/l		3 U				3 U		
RA WS Metals	D	Lead	7439-92-1	ug/l		0.5 J				1.2 J		
RA WS Metals	D	Mercury	7439-97-6	ug/l		0.2 U				0.2 U		
RA WS Metals	D	Selenium	7782-49-2	ug/l		2 U				2 U		
RA WS Metals	D	Silver	7440-22-4	ug/l		0.1 U				0.1 U		
RA WS Metals	T	Arsenic	7440-38-2	ug/l	1 U			1 U				1 U
RA WS Metals	T	Barium	7440-39-3	ug/l	13.1 J			13.5 J				9.7 J
RA WS Metals	T	Cadmium	7440-43-9	ug/l	0.04 J			0.03 J				0.1 U
RA WS Metals	T	Chromium	7440-47-3	ug/l	3 U			3 U				2.4 J
RA WS Metals	T	Lead	7439-92-1	ug/l	1 U			0.6 J				1 U
RA WS Metals	T	Mercury	7439-97-6	ug/l	0.2 U			0.2 U				0.2 U
RA WS Metals	T	Selenium	7782-49-2	ug/l	2 U			2 U				2 U
RA WS Metals	T	Silver	7440-22-4	ug/l	0.1 J			0.1 U				0.1 U
RA WS Other	N	HARDNESS (AS CACO3)	HARD	ug/l								
RA WS PCBs	D	Aroclor 1016	12674-11-2	ug/l								
RA WS PCBs	D	Aroclor 1221	11104-28-2	ug/l								
RA WS PCBs	D	Aroclor 1232	11141-16-5	ug/l								
RA WS PCBs	D	Aroclor 1242	53469-21-9	ug/l								
RA WS PCBs	D	Aroclor 1248	12672-29-6	ug/l								
RA WS PCBs	D	Aroclor 1254	11097-69-1	ug/l								
RA WS PCBs	D	Aroclor 1260	11096-82-5	ug/l								
RA WS PCBs	D	Aroclor 1262	37324-23-5	ug/l								
RA WS PCBs	D	Aroclor 1268	11100-14-4	ug/l								
RA WS PCBs	D	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l								
RA WS PCBs	N	Aroclor 1016	12674-11-2	ug/l								
RA WS PCBs	N	Aroclor 1221	11104-28-2	ug/l								
RA WS PCBs	N	Aroclor 1232	11141-16-5	ug/l								
RA WS PCBs	N	Aroclor 1242	53469-21-9	ug/l								
RA WS PCBs	N	Aroclor 1248	12672-29-6	ug/l								
RA WS PCBs	N	Aroclor 1254	11097-69-1	ug/l								
RA WS PCBs	N	Aroclor 1260	11096-82-5	ug/l								
RA WS PCBs	N	Aroclor 1262	37324-23-5	ug/l								
RA WS PCBs	N	Aroclor 1268	11100-14-4	ug/l								
RA WS PCBs	N	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l								
RA WS VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l								
RA WS VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l								
RA WS VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l								
RA WS VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l								
RA WS VOCs	N	1,1-Dichloroethane	75-34-3	ug/l								
RA WS VOCs	N	1,1-Dichloroethene	75-35-4	ug/l								
RA WS VOCs	N	1,1-Dichloropropene	563-58-6	ug/l								
RA WS VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l								
RA WS VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l								
RA WS VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l								
RA WS VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l								
RA WS VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l								
RA WS VOCs	N	1,2-Dibromoethane	106-93-4	ug/l								
RA WS VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l								
RA WS VOCs	N	1,2-Dichloroethane	107-06-2	ug/l								
RA WS VOCs	N	1,2-Dichloropropane	78-87-5	ug/l								
RA WS VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l								

ATTACHMENT A, TABLE A-6C
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	SW-103-2014	SW-103-2014	SW-103-2014	SW-104-2014	SW-104-2014	SW-104-2014	SW-105-2014
					Sample Type Code	N	N	N	N	N	N	N
					Sample ID	SW-103-A	SW-103-A-F	SW-103-AM	SW-104-A	SW-104-A-F	SW-104-AM	SW-105-A
					Sample Date	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014
					Depth Interval	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.2 - 0.2 ft	0.2 - 0.2 ft	0.2 - 0.2 ft	0.7 - 0.7 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA_WS_VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l								
RA_WS_VOCs	N	1,3-Dichloropropane	142-28-9	ug/l								
RA_WS_VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l								
RA_WS_VOCs	N	2,2-Dichloropropane	594-20-7	ug/l								
RA_WS_VOCs	N	2-Butanone (MEK)	78-93-3	ug/l								
RA_WS_VOCs	N	2-Chlorotoluene	95-49-8	ug/l								
RA_WS_VOCs	N	2-Hexanone	591-78-6	ug/l								
RA_WS_VOCs	N	4-Chlorotoluene	106-43-4	ug/l								
RA_WS_VOCs	N	4-Isopropyltoluene	99-87-6	ug/l								
RA_WS_VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l								
RA_WS_VOCs	N	Acetone	67-64-1	ug/l								
RA_WS_VOCs	N	Benzene	71-43-2	ug/l								
RA_WS_VOCs	N	Bromobenzene	108-86-1	ug/l								
RA_WS_VOCs	N	Bromochloromethane	74-97-5	ug/l								
RA_WS_VOCs	N	Bromodichloromethane	75-27-4	ug/l								
RA_WS_VOCs	N	Bromoform	75-25-2	ug/l								
RA_WS_VOCs	N	Bromomethane	74-83-9	ug/l								
RA_WS_VOCs	N	Carbon Disulfide	75-15-0	ug/l								
RA_WS_VOCs	N	Carbon Tetrachloride	56-23-5	ug/l								
RA_WS_VOCs	N	Chlorobenzene	108-90-7	ug/l								
RA_WS_VOCs	N	Chloroethane	75-00-3	ug/l								
RA_WS_VOCs	N	Chloroform	67-66-3	ug/l								
RA_WS_VOCs	N	Chloromethane	74-87-3	ug/l								
RA_WS_VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l								
RA_WS_VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l								
RA_WS_VOCs	N	dibromochloromethane	124-48-1	ug/l								
RA_WS_VOCs	N	Dibromomethane	74-95-3	ug/l								
RA_WS_VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l								
RA_WS_VOCs	N	Ethylbenzene	100-41-4	ug/l								
RA_WS_VOCs	N	Hexachlorobutadiene	87-68-3	ug/l								
RA_WS_VOCs	N	Isopropylbenzene	98-82-8	ug/l								
RA_WS_VOCs	N	M,P-Xylenes	179601-23-1	ug/l								
RA_WS_VOCs	N	Methylene Chloride	75-09-2	ug/l								
RA_WS_VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l								
RA_WS_VOCs	N	Naphthalene	91-20-3	ug/l								
RA_WS_VOCs	N	n-Butylbenzene	104-51-8	ug/l								
RA_WS_VOCs	N	n-Propylbenzene	103-65-1	ug/l								
RA_WS_VOCs	N	O-Xylene	95-47-6	ug/l								
RA_WS_VOCs	N	sec-Butylbenzene	135-98-8	ug/l								
RA_WS_VOCs	N	Styrene	100-42-5	ug/l								
RA_WS_VOCs	N	tert-Butylbenzene	98-06-6	ug/l								
RA_WS_VOCs	N	Tetrachloroethene	127-18-4	ug/l								
RA_WS_VOCs	N	Toluene	108-88-3	ug/l								
RA_WS_VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l								
RA_WS_VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l								
RA_WS_VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l								
RA_WS_VOCs	N	Trichloroethylene	79-01-6	ug/l								
RA_WS_VOCs	N	Trichlorofluoromethane	75-69-4	ug/l								
RA_WS_VOCs	N	Vinyl Chloride	75-01-4	ug/l								
RA_WS_VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U	
RA_WS_VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U	
RA_WS_VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U	
RA_WS_VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U	
RA_WS_VOCs	T	1,1-Dichloroethane	75-34-3	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U	

ATTACHMENT A, TABLE A-6C
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	SW-103-2014	SW-103-2014	SW-103-2014	SW-104-2014	SW-104-2014	SW-104-2014	SW-105-2014
					Sample Type Code	N	N	N	N	N	N	N
					Sample ID	SW-103-A	SW-103-A-F	SW-103-AM	SW-104-A	SW-104-A-F	SW-104-AM	SW-105-A
					Sample Date	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014
					Depth Interval	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.2 - 0.2 ft	0.2 - 0.2 ft	0.2 - 0.2 ft	0.7 - 0.7 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA WS VOCs	T	1,1-Dichloroethene	75-35-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	1,1-Dichloropropene	563-58-6	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	2 U		0.25 U	2 U		0.25 U	2 U
RA WS VOCs	T	1,2-Dibromoethane	106-93-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	1,2-Dichloroethane	107-06-2	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	1,2-Dichloropropane	78-87-5	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	1,3-Dichloropropane	142-28-9	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	2,2-Dichloropropane	594-20-7	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	2-Butanone (MEK)	78-93-3	ug/l	5 U		5 U	5 U		5 U	5 U
RA WS VOCs	T	2-Chlorotoluene	95-49-8	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	2-Hexanone	591-78-6	ug/l	5 U		2.5 U	5 U		2.5 U	5 U
RA WS VOCs	T	4-Chlorotoluene	106-43-4	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	4-Isopropyltoluene	99-87-6	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l	5 U		2.5 U	5 U		2.5 U	5 U
RA WS VOCs	T	Acetone	67-64-1	ug/l	5 U		5 U	5 U		5 U	5 U
RA WS VOCs	T	Benzene	71-43-2	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	Bromobenzene	108-86-1	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	Bromochloromethane	74-97-5	ug/l	0.5 U		0.5 U	0.5 U		0.5 U	0.5 U
RA WS VOCs	T	Bromodichloromethane	75-27-4	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	Bromoform	75-25-2	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	Bromomethane	74-83-9	ug/l	1 U		0.59 U	1 U		0.59 U	1 U
RA WS VOCs	T	Carbon Disulfide	75-15-0	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	Carbon Tetrachloride	56-23-5	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	Chlorobenzene	108-90-7	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	Chloroethane	75-00-3	ug/l	1 U		0.25 U	1 U		0.25 U	1 U
RA WS VOCs	T	Chloroform	67-66-3	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	Chloromethane	74-87-3	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	dibromochloromethane	124-48-1	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	Dibromomethane	74-95-3	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l	1 U		0.25 U	1 U		0.25 U	1 U
RA WS VOCs	T	Diisopropyl Ether	108-20-3	ug/l			0.25 U			0.25 U	
RA WS VOCs	T	Ethylbenzene	100-41-4	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	Freon 113	76-13-1	ug/l			0.25 U			0.25 U	
RA WS VOCs	T	Hexachlorobutadiene	87-68-3	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	Hexane	110-54-3	ug/l			0.25 U			0.25 U	
RA WS VOCs	T	Isopropylbenzene	98-82-8	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	M,P-Xylenes	179601-23-1	ug/l	0.4 U		0.5 U	0.4 U		0.5 U	0.4 U
RA WS VOCs	T	Methylene Chloride	75-09-2	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	Naphthalene	91-20-3	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	n-Butylbenzene	104-51-8	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	n-Propylbenzene	103-65-1	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA WS VOCs	T	O-Xylene	95-47-6	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA WS VOCs	T	sec-Butylbenzene	135-98-8	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U

ATTACHMENT A, TABLE A-6C
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	SW-103-2014	SW-103-2014	SW-103-2014	SW-104-2014	SW-104-2014	SW-104-2014	SW-105-2014
					Sample Type Code	N	N	N	N	N	N	N
					Sample ID	SW-103-A	SW-103-A-F	SW-103-AM	SW-104-A	SW-104-A-F	SW-104-AM	SW-105-A
					Sample Date	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014	7/31/2014
					Depth Interval	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.2 - 0.2 ft	0.2 - 0.2 ft	0.2 - 0.2 ft	0.7 - 0.7 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA_WS_VOCs	T	Styrene	100-42-5	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA_WS_VOCs	T	tert-Butylbenzene	98-06-6	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA_WS_VOCs	T	Tetrachloroethene	127-18-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA_WS_VOCs	T	Tetrahydrofuran	109-99-9	ug/l			2.5 U			2.5 U	
RA_WS_VOCs	T	Toluene	108-88-3	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA_WS_VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l	0.60 U		0.75 U	0.60 U		0.75 U	0.60 U
RA_WS_VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA_WS_VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.2 U		0.25 U	0.2 U		0.25 U	0.2 U
RA_WS_VOCs	T	Trichloroethylene	79-01-6	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA_WS_VOCs	T	Trichlorofluoromethane	75-69-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U
RA_WS_VOCs	T	Vinyl Chloride	75-01-4	ug/l	0.5 U		0.25 U	0.5 U		0.25 U	0.5 U

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-6C
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	SW-105-2014	SW-105-2014	SW-1A	SW-1A	SW-1A	SW-3A	SW-3A
					Sample Type Code	N	N	N	N	FD	N	N
					Sample ID	SW-105-A-F	SW-105-AM	SW-1A - 11-30-2011	SW-1AF - 11-30-2011	SW-1AFDUP - 11-30-2011	SW-3A - 11-30-2011	SW-3AF - 11-30-2011
					Sample Date	7/31/2014	7/31/2014	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011
					Depth Interval	0.7 - 0.7 ft	0.7 - 0.7 ft	0.25 - 0.25 ft	0.25 - 0.25 ft	0.25 - 0.25 ft	0.5 - 0.5 ft	0.5 - 0.5 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA WS Metals	D	Arsenic	7440-38-2	ug/l	1 U			2.5 UJ	0.5 J		2.5 U
RA WS Metals	D	Barium	7440-39-3	ug/l	9.7 J			5.9 J	6.5 J		12 J
RA WS Metals	D	Cadmium	7440-43-9	ug/l	0.1 U			0.12 U	0.12 U		0.05 J
RA WS Metals	D	Chromium	7440-47-3	ug/l	2.3 J			10 U	10 U		10 U
RA WS Metals	D	Lead	7439-92-1	ug/l	1 U			0.9 J	0.9 J		2.5 U
RA WS Metals	D	Mercury	7439-97-6	ug/l	0.2 U			0.2 U	0.2 U		0.2 U
RA WS Metals	D	Selenium	7782-49-2	ug/l	2 U			5 U	5 U		5 U
RA WS Metals	D	Silver	7440-22-4	ug/l	0.1 U			0.25 U	0.25 U		0.25 U
RA WS Metals	T	Arsenic	7440-38-2	ug/l			2.5 U			2.5 U	
RA WS Metals	T	Barium	7440-39-3	ug/l			6.2 J			13.2 J	
RA WS Metals	T	Cadmium	7440-43-9	ug/l			0.12 U			0.06 J	
RA WS Metals	T	Chromium	7440-47-3	ug/l			10 U			10 U	
RA WS Metals	T	Lead	7439-92-1	ug/l			1.6 J			2.5 U	
RA WS Metals	T	Mercury	7439-97-6	ug/l			0.2 U			0.2 U	
RA WS Metals	T	Selenium	7782-49-2	ug/l			5 U			5 U	
RA WS Metals	T	Silver	7440-22-4	ug/l			0.25 U			0.25 U	
RA WS Other	N	HARDNESS (AS CACO3)	HARD	ug/l			13100			34400	
RA WS PCBs	D	Aroclor 1016	12674-11-2	ug/l				0.11 U			0.1 U
RA WS PCBs	D	Aroclor 1221	11104-28-2	ug/l				0.11 U			0.1 U
RA WS PCBs	D	Aroclor 1232	11141-16-5	ug/l				0.11 U			0.1 U
RA WS PCBs	D	Aroclor 1242	53469-21-9	ug/l				0.11 U			0.1 U
RA WS PCBs	D	Aroclor 1248	12672-29-6	ug/l				0.11 U			0.1 U
RA WS PCBs	D	Aroclor 1254	11097-69-1	ug/l				0.11 U			0.1 U
RA WS PCBs	D	Aroclor 1260	11096-82-5	ug/l				0.11 U			0.1 U
RA WS PCBs	D	Aroclor 1262	37324-23-5	ug/l				0.11 U			0.1 U
RA WS PCBs	D	Aroclor 1268	11100-14-4	ug/l				0.11 U			0.1 U
RA WS PCBs	D	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l				0.99 U			0.90 U
RA WS PCBs	N	Aroclor 1016	12674-11-2	ug/l			0.11 U			0.1 U	
RA WS PCBs	N	Aroclor 1221	11104-28-2	ug/l			0.11 U			0.1 U	
RA WS PCBs	N	Aroclor 1232	11141-16-5	ug/l			0.11 U			0.1 U	
RA WS PCBs	N	Aroclor 1242	53469-21-9	ug/l			0.11 U			0.1 U	
RA WS PCBs	N	Aroclor 1248	12672-29-6	ug/l			0.11 U			0.1 U	
RA WS PCBs	N	Aroclor 1254	11097-69-1	ug/l			0.11 U			0.1 U	
RA WS PCBs	N	Aroclor 1260	11096-82-5	ug/l			0.11 U			0.1 U	
RA WS PCBs	N	Aroclor 1262	37324-23-5	ug/l			0.11 U			0.1 U	
RA WS PCBs	N	Aroclor 1268	11100-14-4	ug/l			0.11 U			0.1 U	
RA WS PCBs	N	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l			0.99 U			0.90 U	
RA WS VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l			1 U			1 U	
RA WS VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l			1 U			1 U	
RA WS VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l			0.5 U			0.5 U	
RA WS VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l			1 U			1 U	
RA WS VOCs	N	1,1-Dichloroethane	75-34-3	ug/l			1 U			1 U	
RA WS VOCs	N	1,1-Dichloroethene	75-35-4	ug/l			1 U			1 U	
RA WS VOCs	N	1,1-Dichloropropene	563-58-6	ug/l			2 U			2 U	
RA WS VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l			1 U			1 U	
RA WS VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l			1 U			1 U	
RA WS VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l			1 U			1 U	
RA WS VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l			1 U			1 U	
RA WS VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l			5 U			5 U	
RA WS VOCs	N	1,2-Dibromoethane	106-93-4	ug/l			1 U			1 U	
RA WS VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l			1 U			1 U	
RA WS VOCs	N	1,2-Dichloroethane	107-06-2	ug/l			1 U			1 U	
RA WS VOCs	N	1,2-Dichloropropane	78-87-5	ug/l			1 U			1 U	
RA WS VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l			1 U			1 U	

ATTACHMENT A, TABLE A-6C
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	SW-105-2014	SW-105-2014	SW-1A	SW-1A	SW-1A	SW-3A	SW-3A
					Sample Type Code	N	N	N	FD	N	N	N
					Sample ID	SW-105-A-F	SW-105-AM	SW-1A - 11-30-2011	SW-1AF - 11-30-2011	SW-1AFDUP - 11-30-2011	SW-3A - 11-30-2011	SW-3AF - 11-30-2011
					Sample Date	7/31/2014	7/31/2014	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011
					Depth Interval	0.7 - 0.7 ft	0.7 - 0.7 ft	0.25 - 0.25 ft	0.25 - 0.25 ft	0.25 - 0.25 ft	0.5 - 0.5 ft	0.5 - 0.5 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA WS VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l			1 U			1 U	
RA WS VOCs	N	1,3-Dichloropropane	142-28-9	ug/l			1 U			1 U	
RA WS VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l			1 U			1 U	
RA WS VOCs	N	2,2-Dichloropropane	594-20-7	ug/l			1 U			1 U	
RA WS VOCs	N	2-Butanone (MEK)	78-93-3	ug/l			10 U			10 U	
RA WS VOCs	N	2-Chlorotoluene	95-49-8	ug/l			1 U			1 U	
RA WS VOCs	N	2-Hexanone	591-78-6	ug/l			10 U			10 U	
RA WS VOCs	N	4-Chlorotoluene	106-43-4	ug/l			1 U			1 U	
RA WS VOCs	N	4-Isopropyltoluene	99-87-6	ug/l			1 U			1 U	
RA WS VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l			10 U			10 U	
RA WS VOCs	N	Acetone	67-64-1	ug/l			10 U			10 U	
RA WS VOCs	N	Benzene	71-43-2	ug/l			1 U			1 U	
RA WS VOCs	N	Bromobenzene	108-86-1	ug/l			2 U			2 U	
RA WS VOCs	N	Bromochloromethane	74-97-5	ug/l			1 U			1 U	
RA WS VOCs	N	Bromodichloromethane	75-27-4	ug/l			0.6 U			0.6 U	
RA WS VOCs	N	Bromoform	75-25-2	ug/l			1 U			1 U	
RA WS VOCs	N	Bromomethane	74-83-9	ug/l			2 U			2 U	
RA WS VOCs	N	Carbon Disulfide	75-15-0	ug/l			1 U			1 U	
RA WS VOCs	N	Carbon Tetrachloride	56-23-5	ug/l			1 U			1 U	
RA WS VOCs	N	Chlorobenzene	108-90-7	ug/l			1 U			1 U	
RA WS VOCs	N	Chloroethane	75-00-3	ug/l			2 U			2 U	
RA WS VOCs	N	Chloroform	67-66-3	ug/l			1 U			1 U	
RA WS VOCs	N	Chloromethane	74-87-3	ug/l			2 U			2 U	
RA WS VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l			1 U			1 U	
RA WS VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l			0.4 U			0.4 U	
RA WS VOCs	N	dibromochloromethane	124-48-1	ug/l			1 U			1 U	
RA WS VOCs	N	Dibromomethane	74-95-3	ug/l			1 U			1 U	
RA WS VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l			2 U			2 U	
RA WS VOCs	N	Ethylbenzene	100-41-4	ug/l			1 U			1 U	
RA WS VOCs	N	Hexachlorobutadiene	87-68-3	ug/l			0.6 U			0.6 U	
RA WS VOCs	N	Isopropylbenzene	98-82-8	ug/l			1 U			1 U	
RA WS VOCs	N	M,P-Xylenes	179601-23-1	ug/l			2 U			2 U	
RA WS VOCs	N	Methylene Chloride	75-09-2	ug/l			2 U			2 U	
RA WS VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l			1 U			1 U	
RA WS VOCs	N	Naphthalene	91-20-3	ug/l			1 U			1 U	
RA WS VOCs	N	n-Butylbenzene	104-51-8	ug/l			1 U			1 U	
RA WS VOCs	N	n-Propylbenzene	103-65-1	ug/l			1 U			1 U	
RA WS VOCs	N	O-Xylene	95-47-6	ug/l			1 U			1 U	
RA WS VOCs	N	sec-Butylbenzene	135-98-8	ug/l			1 U			1 U	
RA WS VOCs	N	Styrene	100-42-5	ug/l			1 U			1 U	
RA WS VOCs	N	tert-Butylbenzene	98-06-6	ug/l			1 U			1 U	
RA WS VOCs	N	Tetrachloroethene	127-18-4	ug/l			1 U			1 U	
RA WS VOCs	N	Toluene	108-88-3	ug/l			1 U			1 U	
RA WS VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l			3.0 U			3.0 U	
RA WS VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l			1 U			1 U	
RA WS VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l			0.4 U			0.4 U	
RA WS VOCs	N	Trichloroethylene	79-01-6	ug/l			1 U			1 U	
RA WS VOCs	N	Trichlorofluoromethane	75-69-4	ug/l			1 U			1 U	
RA WS VOCs	N	Vinyl Chloride	75-01-4	ug/l			1 U			1 U	
RA WS VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l		0.25 U					
RA WS VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l		0.25 U					
RA WS VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l		0.25 U					
RA WS VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l		0.25 U					
RA WS VOCs	T	1,1-Dichloroethane	75-34-3	ug/l		0.25 U					

ATTACHMENT A, TABLE A-6C
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	SW-105-2014	SW-105-2014	SW-1A	SW-1A	SW-1A	SW-3A	SW-3A
					Sample Type Code	N	N	N	N	FD	N	N
					Sample ID	SW-105-A-F	SW-105-AM	SW-1A - 11-30-2011	SW-1AF - 11-30-2011	SW-1AFDUP - 11-30-2011	SW-3A - 11-30-2011	SW-3AF - 11-30-2011
					Sample Date	7/31/2014	7/31/2014	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011
					Depth Interval	0.7 - 0.7 ft	0.7 - 0.7 ft	0.25 - 0.25 ft	0.25 - 0.25 ft	0.25 - 0.25 ft	0.5 - 0.5 ft	0.5 - 0.5 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA WS VOCs	T	1,1-Dichloroethene	75-35-4	ug/l		0.25 U						
RA WS VOCs	T	1,1-Dichloropropene	563-58-6	ug/l		0.25 U						
RA WS VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l		0.12 J						
RA WS VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l		0.25 U						
RA WS VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l		0.25 U						
RA WS VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l		0.25 U						
RA WS VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l		0.25 U						
RA WS VOCs	T	1,2-Dibromoethane	106-93-4	ug/l		0.25 U						
RA WS VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l		0.25 U						
RA WS VOCs	T	1,2-Dichloroethane	107-06-2	ug/l		0.25 U						
RA WS VOCs	T	1,2-Dichloropropane	78-87-5	ug/l		0.25 U						
RA WS VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l		0.25 U						
RA WS VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l		0.25 U						
RA WS VOCs	T	1,3-Dichloropropane	142-28-9	ug/l		0.25 U						
RA WS VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l		0.25 U						
RA WS VOCs	T	2,2-Dichloropropane	594-20-7	ug/l		0.25 U						
RA WS VOCs	T	2-Butanone (MEK)	78-93-3	ug/l		5 U						
RA WS VOCs	T	2-Chlorotoluene	95-49-8	ug/l		0.25 U						
RA WS VOCs	T	2-Hexanone	591-78-6	ug/l		2.5 U						
RA WS VOCs	T	4-Chlorotoluene	106-43-4	ug/l		0.25 U						
RA WS VOCs	T	4-Isopropyltoluene	99-87-6	ug/l		0.25 U						
RA WS VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l		2.5 U						
RA WS VOCs	T	Acetone	67-64-1	ug/l		4.4 J						
RA WS VOCs	T	Benzene	71-43-2	ug/l		0.25 U						
RA WS VOCs	T	Bromobenzene	108-86-1	ug/l		0.25 U						
RA WS VOCs	T	Bromochloromethane	74-97-5	ug/l		0.5 U						
RA WS VOCs	T	Bromodichloromethane	75-27-4	ug/l		0.25 U						
RA WS VOCs	T	Bromoform	75-25-2	ug/l		0.25 U						
RA WS VOCs	T	Bromomethane	74-83-9	ug/l		0.59 U						
RA WS VOCs	T	Carbon Disulfide	75-15-0	ug/l		2.6						
RA WS VOCs	T	Carbon Tetrachloride	56-23-5	ug/l		0.25 U						
RA WS VOCs	T	Chlorobenzene	108-90-7	ug/l		0.25 U						
RA WS VOCs	T	Chloroethane	75-00-3	ug/l		0.25 U						
RA WS VOCs	T	Chloroform	67-66-3	ug/l		0.25 U						
RA WS VOCs	T	Chloromethane	74-87-3	ug/l		0.25 U						
RA WS VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l		0.25 U						
RA WS VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l		0.25 U						
RA WS VOCs	T	dibromochloromethane	124-48-1	ug/l		0.25 U						
RA WS VOCs	T	Dibromomethane	74-95-3	ug/l		0.25 U						
RA WS VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l		0.25 U						
RA WS VOCs	T	Diisopropyl Ether	108-20-3	ug/l		0.25 U						
RA WS VOCs	T	Ethylbenzene	100-41-4	ug/l		0.25 U						
RA WS VOCs	T	Freon 113	76-13-1	ug/l		0.25 U						
RA WS VOCs	T	Hexachlorobutadiene	87-68-3	ug/l		0.25 U						
RA WS VOCs	T	Hexane	110-54-3	ug/l		0.25 U						
RA WS VOCs	T	Isopropylbenzene	98-82-8	ug/l		0.25 U						
RA WS VOCs	T	M,P-Xylenes	179601-23-1	ug/l		0.5 U						
RA WS VOCs	T	Methylene Chloride	75-09-2	ug/l		0.25 U						
RA WS VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l		0.25 U						
RA WS VOCs	T	Naphthalene	91-20-3	ug/l		0.18 J						
RA WS VOCs	T	n-Butylbenzene	104-51-8	ug/l		0.25 U						
RA WS VOCs	T	n-Propylbenzene	103-65-1	ug/l		0.25 U						
RA WS VOCs	T	O-Xylene	95-47-6	ug/l		0.25 U						
RA WS VOCs	T	sec-Butylbenzene	135-98-8	ug/l		0.25 U						

ATTACHMENT A, TABLE A-6C
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SW-105-2014	SW-105-2014	SW-1A	SW-1A	SW-1A	SW-3A	SW-3A
				Sample Type Code	N	N	N	N	FD	N	N
				Sample ID	SW-105-A-F	SW-105-AM	SW-1A - 11-30-2011	SW-1AF - 11-30-2011	SW-1AFDUP - 11-30-2011	SW-3A - 11-30-2011	SW-3AF - 11-30-2011
				Sample Date	7/31/2014	7/31/2014	11/30/2011	11/30/2011	11/30/2011	11/30/2011	11/30/2011
				Depth Interval	0.7 - 0.7 ft	0.7 - 0.7 ft	0.25 - 0.25 ft	0.25 - 0.25 ft	0.25 - 0.25 ft	0.5 - 0.5 ft	0.5 - 0.5 ft
Method Analyte Group	Fraction	Compound	CAS #	Units							
RA_WS_VOCs	T	Styrene	100-42-5	ug/l		0.25 U					
RA_WS_VOCs	T	tert-Butylbenzene	98-06-6	ug/l		0.25 U					
RA_WS_VOCs	T	Tetrachloroethene	127-18-4	ug/l		0.25 U					
RA_WS_VOCs	T	Tetrahydrofuran	109-99-9	ug/l		2.5 U					
RA_WS_VOCs	T	Toluene	108-88-3	ug/l		0.25 U					
RA_WS_VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l		0.75 U					
RA_WS_VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l		0.25 U					
RA_WS_VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l		0.25 U					
RA_WS_VOCs	T	Trichloroethylene	79-01-6	ug/l		0.25 U					
RA_WS_VOCs	T	Trichlorofluoromethane	75-69-4	ug/l		0.25 U					
RA_WS_VOCs	T	Vinyl Chloride	75-01-4	ug/l		0.25 U					

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-6C
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	SW-3A	SW-3A	SW-4A	SW-4A	SW-4A	SW-5A	SW-5A
					Sample Type Code	FD	FD	N	FA	FD	N	N
					Sample ID	SW-3AD - 11-30-2011	SW-3ADF - 11-30-2011	SW-4A - 11-29-2011	SW-4A F - 11-29-2011	SW-4ADUP - 11-29-2011	SW-5A - 11-29-2011	SW-5A F - 11-29-2011
					Sample Date	11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011
					Depth Interval	0.5 - 0.5 ft	0.5 - 0.5 ft	0.15 - 0.15 ft	0.15 - 0.15 ft	0.15 - 0.15 ft	0.35 - 0.35 ft	0.35 - 0.35 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA WS Metals	D	Arsenic	7440-38-2	ug/l		2.5 U		2.5 U				2.5 U
RA WS Metals	D	Barium	7440-39-3	ug/l		16 J		4.7 J				4.1 J
RA WS Metals	D	Cadmium	7440-43-9	ug/l		0.06 J		0.12 U				0.12 U
RA WS Metals	D	Chromium	7440-47-3	ug/l		10 U		10 U				10 U
RA WS Metals	D	Lead	7439-92-1	ug/l		2.5 U		2.5 U				2.5 U
RA WS Metals	D	Mercury	7439-97-6	ug/l		0.2 U		0.2 U				0.2 U
RA WS Metals	D	Selenium	7782-49-2	ug/l		5 U		5 UJ				5 UJ
RA WS Metals	D	Silver	7440-22-4	ug/l		0.25 U		0.25 U				0.25 U
RA WS Metals	T	Arsenic	7440-38-2	ug/l	2.5 U		2.5 UJ		2.5 UJ	2.5 U		
RA WS Metals	T	Barium	7440-39-3	ug/l	13.2 J		4.7 J		4.7 J	4.2 J		
RA WS Metals	T	Cadmium	7440-43-9	ug/l	0.05 J		0.12 U		0.12 U	0.12 U		
RA WS Metals	T	Chromium	7440-47-3	ug/l	10 U		10 U		10 U	10 U		
RA WS Metals	T	Lead	7439-92-1	ug/l	2.5 U		2.5 U		2.5 U	2.5 U		
RA WS Metals	T	Mercury	7439-97-6	ug/l	0.2 U		0.2 U		0.2 U	0.2 U		
RA WS Metals	T	Selenium	7782-49-2	ug/l	5 U		5 UJ		5 U	5 UJ		
RA WS Metals	T	Silver	7440-22-4	ug/l	0.25 U		0.25 U		0.25 U	0.25 U		
RA WS Other	N	HARDNESS (AS CACO3)	HARD	ug/l	36000		55100			628000		
RA WS PCBs	D	Aroclor 1016	12674-11-2	ug/l		0.1 U		0.1 U				0.1 U
RA WS PCBs	D	Aroclor 1221	11104-28-2	ug/l		0.1 U		0.1 U				0.1 U
RA WS PCBs	D	Aroclor 1232	11141-16-5	ug/l		0.1 U		0.1 U				0.1 U
RA WS PCBs	D	Aroclor 1242	53469-21-9	ug/l		0.1 U		0.1 U				0.1 U
RA WS PCBs	D	Aroclor 1248	12672-29-6	ug/l		0.1 U		0.1 U				0.1 U
RA WS PCBs	D	Aroclor 1254	11097-69-1	ug/l		0.1 U		0.1 U				0.1 U
RA WS PCBs	D	Aroclor 1260	11096-82-5	ug/l		0.1 U		0.1 U				0.1 U
RA WS PCBs	D	Aroclor 1262	37324-23-5	ug/l		0.1 U		0.1 U				0.1 U
RA WS PCBs	D	Aroclor 1268	11100-14-4	ug/l		0.1 U		0.1 U				0.1 U
RA WS PCBs	D	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l		0.90 U		0.90 U				0.90 U
RA WS PCBs	N	Aroclor 1016	12674-11-2	ug/l	0.11 U		0.11 U			0.1 U		
RA WS PCBs	N	Aroclor 1221	11104-28-2	ug/l	0.11 U		0.11 U			0.1 U		
RA WS PCBs	N	Aroclor 1232	11141-16-5	ug/l	0.11 U		0.11 U			0.1 U		
RA WS PCBs	N	Aroclor 1242	53469-21-9	ug/l	0.11 U		0.11 U			0.1 U		
RA WS PCBs	N	Aroclor 1248	12672-29-6	ug/l	0.11 U		0.11 U			0.1 U		
RA WS PCBs	N	Aroclor 1254	11097-69-1	ug/l	0.11 U		0.11 U			0.1 U		
RA WS PCBs	N	Aroclor 1260	11096-82-5	ug/l	0.11 U		0.11 U			0.1 U		
RA WS PCBs	N	Aroclor 1262	37324-23-5	ug/l	0.11 U		0.11 U			0.1 U		
RA WS PCBs	N	Aroclor 1268	11100-14-4	ug/l	0.11 U		0.11 U			0.1 U		
RA WS PCBs	N	Total PCB Aroclors (a)	Tot-PCB-ARO	ug/l	0.99 U		0.99 U			0.90 U		
RA WS VOCs	N	1,1,1,2-Tetrachloroethane	630-20-6	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,1,1-Trichloroethane	71-55-6	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.5 U		0.5 U			0.5 U		
RA WS VOCs	N	1,1,2-Trichloroethane	79-00-5	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,1-Dichloroethane	75-34-3	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,1-Dichloroethene	75-35-4	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,1-Dichloropropene	563-58-6	ug/l	2 U		2 U			2 U		
RA WS VOCs	N	1,2,3-Trichlorobenzene	87-61-6	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,2,3-Trichloropropane	96-18-4	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,2,4-Trichlorobenzene	120-82-1	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,2,4-Trimethylbenzene	95-63-6	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l	5 U		5 U			5 U		
RA WS VOCs	N	1,2-Dibromoethane	106-93-4	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,2-Dichlorobenzene	95-50-1	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,2-Dichloroethane	107-06-2	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,2-Dichloropropane	78-87-5	ug/l	1 U		1 U			1 U		
RA WS VOCs	N	1,3,5-Trimethylbenzene	108-67-8	ug/l	1 U		1 U			1 U		

ATTACHMENT A, TABLE A-6C
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SW-3A	SW-3A	SW-4A	SW-4A	SW-4A	SW-5A	SW-5A
				Sample Type Code	FD	FD	N	N	FD	N	N
				Sample ID	SW-3AD - 11-30-2011	SW-3ADF - 11-30-2011	SW-4A - 11-29-2011	SW-4A F - 11-29-2011	SW-4ADUP - 11-29-2011	SW-5A - 11-29-2011	SW-5A F - 11-29-2011
				Sample Date	11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011
				Depth Interval	0.5 - 0.5 ft	0.5 - 0.5 ft	0.15 - 0.15 ft	0.15 - 0.15 ft	0.15 - 0.15 ft	0.35 - 0.35 ft	0.35 - 0.35 ft
Method Analyte Group	Fraction	Compound	CAS #	Units							
RA WS VOCs	N	1,3-Dichlorobenzene	541-73-1	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	1,3-Dichloropropane	142-28-9	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	1,4-Dichlorobenzene	106-46-7	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	2,2-Dichloropropane	594-20-7	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	2-Butanone (MEK)	78-93-3	ug/l	10 U		10 U			10 U	
RA WS VOCs	N	2-Chlorotoluene	95-49-8	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	2-Hexanone	591-78-6	ug/l	10 U		10 U			10 U	
RA WS VOCs	N	4-Chlorotoluene	106-43-4	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	4-Isopropyltoluene	99-87-6	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	4-Methyl-2-pentanone	108-10-1	ug/l	10 U		10 U			10 U	
RA WS VOCs	N	Acetone	67-64-1	ug/l	10 U		10 U			10 U	
RA WS VOCs	N	Benzene	71-43-2	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Bromobenzene	108-86-1	ug/l	2 U		2 U			2 U	
RA WS VOCs	N	Bromochloromethane	74-97-5	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Bromodichloromethane	75-27-4	ug/l	0.6 U		0.6 U			0.6 U	
RA WS VOCs	N	Bromoform	75-25-2	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Bromomethane	74-83-9	ug/l	2 U		2 U			2 U	
RA WS VOCs	N	Carbon Disulfide	75-15-0	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Carbon Tetrachloride	56-23-5	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Chlorobenzene	108-90-7	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Chloroethane	75-00-3	ug/l	2 U		2 U			2 U	
RA WS VOCs	N	Chloroform	67-66-3	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Chloromethane	74-87-3	ug/l	2 U		2 U			2 U	
RA WS VOCs	N	cis-1,2-Dichloroethene	156-59-2	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	cis-1,3-Dichloropropene	10061-01-5	ug/l	0.4 U		0.4 U			0.4 U	
RA WS VOCs	N	dibromochloromethane	124-48-1	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Dibromomethane	74-95-3	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Dichlorodifluoromethane	75-71-8	ug/l	2 U		2 U			2 U	
RA WS VOCs	N	Ethylbenzene	100-41-4	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Hexachlorobutadiene	87-68-3	ug/l	0.6 U		0.6 U			0.6 U	
RA WS VOCs	N	Isopropylbenzene	98-82-8	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	M,P-Xylenes	179601-23-1	ug/l	2 U		2 U			2 U	
RA WS VOCs	N	Methylene Chloride	75-09-2	ug/l	2 U		2 U			2 U	
RA WS VOCs	N	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Naphthalene	91-20-3	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	n-Butylbenzene	104-51-8	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	n-Propylbenzene	103-65-1	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	O-Xylene	95-47-6	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	sec-Butylbenzene	135-98-8	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Styrene	100-42-5	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	tert-Butylbenzene	98-06-6	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Tetrachloroethene	127-18-4	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Toluene	108-88-3	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Total Xylenes (a)	Tot-Xylenes	ug/l	3.0 U		3.0 U			3.0 U	
RA WS VOCs	N	trans-1,2-Dichloroethene	156-60-5	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	trans-1,3-Dichloropropene	10061-02-6	ug/l	0.4 U		0.4 U			0.4 U	
RA WS VOCs	N	Trichloroethylene	79-01-6	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Trichlorofluoromethane	75-69-4	ug/l	1 U		1 U			1 U	
RA WS VOCs	N	Vinyl Chloride	75-01-4	ug/l	1 U		1 U			1 U	
RA WS VOCs	T	1,1,1,2-Tetrachloroethane	630-20-6	ug/l							
RA WS VOCs	T	1,1,1-Trichloroethane	71-55-6	ug/l							
RA WS VOCs	T	1,1,2,2-Tetrachloroethane	79-34-5	ug/l							
RA WS VOCs	T	1,1,2-Trichloroethane	79-00-5	ug/l							
RA WS VOCs	T	1,1-Dichloroethane	75-34-3	ug/l							

ATTACHMENT A, TABLE A-6C
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
					Location ID	SW-3A	SW-3A	SW-4A	SW-4A	SW-4A	SW-5A	SW-5A
					Sample Type Code	FD	FD	N	N	FD	N	N
					Sample ID	SW-3AD - 11-30-2011	SW-3ADF - 11-30-2011	SW-4A - 11-29-2011	SW-4A F - 11-29-2011	SW-4ADUP - 11-29-2011	SW-5A - 11-29-2011	SW-5A F - 11-29-2011
					Sample Date	11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011
					Depth Interval	0.5 - 0.5 ft	0.5 - 0.5 ft	0.15 - 0.15 ft	0.15 - 0.15 ft	0.15 - 0.15 ft	0.35 - 0.35 ft	0.35 - 0.35 ft
Method Analyte Group	Fraction	Compound	CAS #	Units								
RA WS VOCs	T	1,1-Dichloroethene	75-35-4	ug/l								
RA WS VOCs	T	1,1-Dichloropropene	563-58-6	ug/l								
RA WS VOCs	T	1,2,3-Trichlorobenzene	87-61-6	ug/l								
RA WS VOCs	T	1,2,3-Trichloropropane	96-18-4	ug/l								
RA WS VOCs	T	1,2,4-Trichlorobenzene	120-82-1	ug/l								
RA WS VOCs	T	1,2,4-Trimethylbenzene	95-63-6	ug/l								
RA WS VOCs	T	1,2-Dibromo-3-Chloropropane	96-12-8	ug/l								
RA WS VOCs	T	1,2-Dibromoethane	106-93-4	ug/l								
RA WS VOCs	T	1,2-Dichlorobenzene	95-50-1	ug/l								
RA WS VOCs	T	1,2-Dichloroethane	107-06-2	ug/l								
RA WS VOCs	T	1,2-Dichloropropane	78-87-5	ug/l								
RA WS VOCs	T	1,3,5-Trimethylbenzene	108-67-8	ug/l								
RA WS VOCs	T	1,3-Dichlorobenzene	541-73-1	ug/l								
RA WS VOCs	T	1,3-Dichloropropane	142-28-9	ug/l								
RA WS VOCs	T	1,4-Dichlorobenzene	106-46-7	ug/l								
RA WS VOCs	T	2,2-Dichloropropane	594-20-7	ug/l								
RA WS VOCs	T	2-Butanone (MEK)	78-93-3	ug/l								
RA WS VOCs	T	2-Chlorotoluene	95-49-8	ug/l								
RA WS VOCs	T	2-Hexanone	591-78-6	ug/l								
RA WS VOCs	T	4-Chlorotoluene	106-43-4	ug/l								
RA WS VOCs	T	4-Isopropyltoluene	99-87-6	ug/l								
RA WS VOCs	T	4-Methyl-2-pentanone	108-10-1	ug/l								
RA WS VOCs	T	Acetone	67-64-1	ug/l								
RA WS VOCs	T	Benzene	71-43-2	ug/l								
RA WS VOCs	T	Bromobenzene	108-86-1	ug/l								
RA WS VOCs	T	Bromochloromethane	74-97-5	ug/l								
RA WS VOCs	T	Bromodichloromethane	75-27-4	ug/l								
RA WS VOCs	T	Bromoform	75-25-2	ug/l								
RA WS VOCs	T	Bromomethane	74-83-9	ug/l								
RA WS VOCs	T	Carbon Disulfide	75-15-0	ug/l								
RA WS VOCs	T	Carbon Tetrachloride	56-23-5	ug/l								
RA WS VOCs	T	Chlorobenzene	108-90-7	ug/l								
RA WS VOCs	T	Chloroethane	75-00-3	ug/l								
RA WS VOCs	T	Chloroform	67-66-3	ug/l								
RA WS VOCs	T	Chloromethane	74-87-3	ug/l								
RA WS VOCs	T	cis-1,2-Dichloroethene	156-59-2	ug/l								
RA WS VOCs	T	cis-1,3-Dichloropropene	10061-01-5	ug/l								
RA WS VOCs	T	dibromochloromethane	124-48-1	ug/l								
RA WS VOCs	T	Dibromomethane	74-95-3	ug/l								
RA WS VOCs	T	Dichlorodifluoromethane	75-71-8	ug/l								
RA WS VOCs	T	Diisopropyl Ether	108-20-3	ug/l								
RA WS VOCs	T	Ethylbenzene	100-41-4	ug/l								
RA WS VOCs	T	Freon 113	76-13-1	ug/l								
RA WS VOCs	T	Hexachlorobutadiene	87-68-3	ug/l								
RA WS VOCs	T	Hexane	110-54-3	ug/l								
RA WS VOCs	T	Isopropylbenzene	98-82-8	ug/l								
RA WS VOCs	T	M,P-Xylenes	179601-23-1	ug/l								
RA WS VOCs	T	Methylene Chloride	75-09-2	ug/l								
RA WS VOCs	T	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/l								
RA WS VOCs	T	Naphthalene	91-20-3	ug/l								
RA WS VOCs	T	n-Butylbenzene	104-51-8	ug/l								
RA WS VOCs	T	n-Propylbenzene	103-65-1	ug/l								
RA WS VOCs	T	O-Xylene	95-47-6	ug/l								
RA WS VOCs	T	sec-Butylbenzene	135-98-8	ug/l								

ATTACHMENT A, TABLE A-6C
SURFACE WATER ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area	Off-Project Red Maple Swamp / Tidal Stream Area
				Location ID	SW-3A	SW-3A	SW-4A	SW-4A	SW-4A	SW-5A	SW-5A
				Sample Type Code	FD	FD	N	N	FD	N	N
				Sample ID	SW-3AD - 11-30-2011	SW-3ADF - 11-30-2011	SW-4A - 11-29-2011	SW-4A F - 11-29-2011	SW-4ADUP - 11-29-2011	SW-5A - 11-29-2011	SW-5A F - 11-29-2011
				Sample Date	11/30/2011	11/30/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011	11/29/2011
				Depth Interval	0.5 - 0.5 ft	0.5 - 0.5 ft	0.15 - 0.15 ft	0.15 - 0.15 ft	0.15 - 0.15 ft	0.35 - 0.35 ft	0.35 - 0.35 ft
Method Analyte Group	Fraction	Compound	CAS #	Units							
RA_WS_VOCs	T	Styrene	100-42-5	ug/l							
RA_WS_VOCs	T	tert-Butylbenzene	98-06-6	ug/l							
RA_WS_VOCs	T	Tetrachloroethene	127-18-4	ug/l							
RA_WS_VOCs	T	Tetrahydrofuran	109-99-9	ug/l							
RA_WS_VOCs	T	Toluene	108-88-3	ug/l							
RA_WS_VOCs	T	Total Xylenes (a)	Tot-Xylenes	ug/l							
RA_WS_VOCs	T	trans-1,2-Dichloroethene	156-60-5	ug/l							
RA_WS_VOCs	T	trans-1,3-Dichloropropene	10061-02-6	ug/l							
RA_WS_VOCs	T	Trichloroethylene	79-01-6	ug/l							
RA_WS_VOCs	T	Trichlorofluoromethane	75-69-4	ug/l							
RA_WS_VOCs	T	Vinyl Chloride	75-01-4	ug/l							

Notes:
CAS = Chemical Abstracts Service.
D = Dissolved/filtered.
FD = Field duplicate.
ft = Feet.
J = The chemical was positively identified; however, the associated numerical value is an estimated concentration.
N = Normal sample.
PCB = Polychlorinated Biphenyl.
T = Total/unfiltered.
U = Not detected above the reported limit of detection (LOD).
UJ = The analyte was not detected; and the reporting limit is approximate.
ug/l = Micrograms per liter.
VOC = Volatile organic compound.
(a) Associated total results were calculated as described in the risk assessment report text.

ATTACHMENT A, TABLE A-7A
SOIL VAPOR SAMPLE SUMMARY TABLE
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Matrix Code	Area	Location ID	Sample Date	Sample ID	Sample Type	Depth Interval
SV	On-Project Blue Beach	EA01VP	3/17/2006	EA01VP-031706	N	8 - 12 ft
SV	On-Project Blue Beach	EA04VP	3/17/2006	EA04VP-031706	N	8 - 12 ft
SV	On-Project Blue Beach	EA15VP	3/17/2006	EA15VP-031706	N	8 - 12 ft
SV	On-Project Blue Beach	EA20VP	3/17/2006	EA20VP-031706	N	8 - 12 ft
SV	On-Project Blue Beach	EA26VP	3/17/2006	EA26VP-031706	N	8 - 12 ft
SV	On-Project Blue Beach	EA27VP	3/17/2006	EA27VP-031706	N	8 - 12 ft

Notes:
ft - Feet.
N - Normal sample.
SV - Soil Vapor.

ATTACHMENT A, TABLE A-7B
SOIL VAPOR ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
				Location ID	EA01VP	EA04VP	EA15VP	EA20VP	EA26VP	EA27VP
				Sample Type Code	N	N	N	N	N	N
				Sample ID	EA01VP-031706	EA04VP-031706	EA15VP-031706	EA20VP-031706	EA26VP-031706	EA27VP-031706
				Sample Date	3/17/2006	3/17/2006	3/17/2006	3/17/2006	3/17/2006	3/17/2006
				Depth Interval	8 - 12 ft	8 - 12 ft	8 - 12 ft	8 - 12 ft	8 - 12 ft	8 - 12 ft
Method Analyte Group	Compound	CAS #	Units							
TO-15	1,1,1-Trichloroethane	71-55-6	ug/m3	1.6 U	1.6 U	16 U	16 U	16 U	16 U
TO-15	1,1,2,2-Tetrachloroethane	79-34-5	ug/m3	2.1 U	2.1 U	21 U	21 U	21 U	21 U
TO-15	1,1,2-Trichloroethane	79-00-5	ug/m3	1.6 U	1.6 U	16 U	16 U	16 U	16 U
TO-15	1,1-Dichloroethane	75-34-3	ug/m3	2.8	1.2 U	12 U	12 U	12 U	12 U
TO-15	1,1-Dichloroethene	75-35-4	ug/m3	1.2 U	1.2 U	12 U	12 U	12 U	12 U
TO-15	1,2,4-Trichlorobenzene	120-82-1	ug/m3	2.2 U	2.2 U	22 U	22 U	22 U	22 U
TO-15	1,2,4-Trimethylbenzene	95-63-6	ug/m3	3.6	1.5 U	15 U	15 U	15 U	15 U
TO-15	1,2-Dibromoethane	106-93-4	ug/m3	2.3 U	2.3 U	23 U	23 U	23 U	23 U
TO-15	1,2-Dichlorobenzene	95-50-1	ug/m3	1.8 U	1.8 U	18 U	18 U	18 U	18 U
TO-15	1,2-Dichloroethane	107-06-2	ug/m3	1.2 U	1.2 U	12 U	12 U	12 U	12 U
TO-15	1,2-Dichloropropane	78-87-5	ug/m3	1.4 U	1.4 U	14 U	14 U	14 U	14 U
TO-15	1,2-Dichlorotetrafluoroethane(114)	76-14-2	ug/m3	2.1 U	2.1 U	21 U	21 U	21 U	21 U
TO-15	1,3,5-Trimethylbenzene	108-67-8	ug/m3	1.5 U	1.5 U	15 U	15 U	15 U	15 U
TO-15	1,3-Butadiene	106-99-0	ug/m3	0.7 U	0.7 U	6.6 U	6.6 U	6.6 U	6.6 U
TO-15	1,3-Dichlorobenzene	541-73-1	ug/m3	1.8 U	1.8 U	18 U	18 U	18 U	18 U
TO-15	1,4-Dichlorobenzene	106-46-7	ug/m3	1.8 U	1.8 U	18 U	18 U	18 U	18 U
TO-15	2-Butanone (MEK)	78-93-3	ug/m3	3.7	4.7	8.8 U	8.8 U	8.8 U	22
TO-15	2-Hexanone	591-78-6	ug/m3	1.2 U	1.2 U	12 U	12 U	12 U	12 U
TO-15	4-Ethyl Toluene	622-96-8	ug/m3	2.1	1.5 U	15 U	15 U	15 U	15 U
TO-15	4-Methyl-2-pentanone	108-10-1	ug/m3	3.8	1.2 U	12 U	12 U	12 U	12 U
TO-15	Acetone	67-64-1	ug/m3	16	0.7 U	7.2 U	7.2 U	7.2 U	7.2 U
TO-15	Benzene	71-43-2	ug/m3	1 U	1 U	9.6 U	9.6 U	160	9.6 U
TO-15	Benzyl Chloride	100-44-7	ug/m3	1.6 U	1.6 U	16 U	16 U	16 U	16 U
TO-15	Bromodichloromethane	75-27-4	ug/m3	2 U	2 U	20 U	20 U	20 U	20 U
TO-15	Bromomethane	74-83-9	ug/m3	1.2 U	1.2 U	12 U	12 U	12 U	12 U
TO-15	Carbon Disulfide	75-15-0	ug/m3	0.9 U	0.9 U	9.4 U	9.4 U	9.4 U	9.4 U
TO-15	Carbon Tetrachloride	56-23-5	ug/m3	1.9 U	1.9 U	19 U	19 U	19 U	19 U
TO-15	Chlorobenzene	108-90-7	ug/m3	1.4 U	1.4 U	14 U	14 U	14 U	14 U
TO-15	Chloroethane	75-00-3	ug/m3	0.8 U	0.8 U	8 U	8 U	8 U	8 U
TO-15	Chloroform	67-66-3	ug/m3	1.5 U	1.5 U	15 U	15 U	15 U	15 U
TO-15	Chloromethane	74-87-3	ug/m3	1.2	0.7 U	7.4 U	7.4 U	7.4 U	7.4 U
TO-15	cis-1,2-Dichloroethene	156-59-2	ug/m3	1.2 U	1.2 U	12 U	12 U	12 U	51
TO-15	cis-1,3-Dichloropropene	10061-01-5	ug/m3	1.4 U	1.4 U	14 U	14 U	14 U	14 U
TO-15	Cyclohexane	110-82-7	ug/m3	1 U	1 U	66	430	10 U	20
TO-15	dibromochloromethane	124-48-1	ug/m3	2.6 U	2.6 U	26 U	26 U	26 U	26 U
TO-15	Dichlorodifluoromethane	75-71-8	ug/m3	1.5 U	2.5	15 U	15 U	15 U	15 U
TO-15	Ethanol	64-17-5	ug/m3	1	4.3	5.6 U	5.6 U	5.6 U	14
TO-15	Ethyl Acetate	141-78-6	ug/m3	1.1 U	1.1 U	11 U	11 U	11 U	11 U
TO-15	Ethylbenzene	100-41-4	ug/m3	1.3 U	1.3 U	13 U	13 U	13 U	13 U
TO-15	Freon 113	76-13-1	ug/m3	2.3 U	2.3 U	23 U	23 U	23 U	23 U
TO-15	Hexachlorobutadiene	87-68-3	ug/m3	3.2 U	3.2 U	32 U	32 U	32 U	32 U
TO-15	Hexane	110-54-3	ug/m3	1.1 U	1.1 U	11 U	490	11 U	11 U
TO-15	Isopropanol	67-63-0	ug/m3	0.7 U	2.4	7.4 U	7.4 U	7.4 U	7.4 U
TO-15	M,P-Xylenes	179601-23-1	ug/m3	1.3 U	1.3 U	13 U	13 U	13 U	13 U
TO-15	Methylene Chloride	75-09-2	ug/m3	1.9 U	2.7	19 U	19 U	19 U	19 U
TO-15	Methyl-t-butyl ether (MTBE)	1634-04-4	ug/m3	10	1.7	11 U	11 U	11 U	11 U
TO-15	n-Heptane	142-82-5	ug/m3	1.2 U	1.2 U	12 U	1400	12 U	12 U
TO-15	O-Xylene	95-47-6	ug/m3	1.3 U	1.3 U	13 U	13 U	13 U	13 U
TO-15	Propene	115-07-1	ug/m3	0.5 U	0.5 U	5.2 U	5.2 U	5.2 U	5.2 U
TO-15	Styrene	100-42-5	ug/m3	1.3 U	1.3 U	13 U	13 U	13 U	13 U
TO-15	Tetrachloroethene	127-18-4	ug/m3	3.7	6.2	20 U	20 U	20 U	20 U
TO-15	Tetrahydrofuran	109-99-9	ug/m3	0.9 U	0.9 U	8.8 U	8.8 U	8.8 U	8.8 U
TO-15	Toluene	108-88-3	ug/m3	1.1 U	1.1 U	11 U	11 U	11 U	11 U
TO-15	Total Xylenes (a)	Tot-Xylenes	ug/m3	2.6 U	2.6 U	26 U	26 U	26 U	26 U
TO-15	trans-1,2-Dichloroethene	156-60-5	ug/m3	1.2 U	1.2 U	12 U	12 U	12 U	18

ATTACHMENT A, TABLE A-7B
SOIL VAPOR ANALYTICAL DATA SUMMARY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

			Location Group	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area	On-Project Blue Beach Area
			Location ID	EA01VP	EA04VP	EA15VP	EA20VP	EA26VP	EA27VP
			Sample Type Code	N	N	N	N	N	N
			Sample ID	EA01VP-031706	EA04VP-031706	EA15VP-031706	EA20VP-031706	EA26VP-031706	EA27VP-031706
			Sample Date	3/17/2006	3/17/2006	3/17/2006	3/17/2006	3/17/2006	3/17/2006
			Depth Interval	8 - 12 ft	8 - 12 ft	8 - 12 ft	8 - 12 ft	8 - 12 ft	8 - 12 ft
Method Analyte Group	Compound	CAS #	Units						
TO-15	trans-1,3-Dichloropropene	10061-02-6	ug/m3	1.4 U	1.4 U	14 U	14 U	14 U	14 U
TO-15	Trichloroethylene	79-01-6	ug/m3	1.6 U	1.6 U	16 U	16 U	16 U	16 U
TO-15	Trichlorofluoromethane	75-69-4	ug/m3	5.6	1.8 U	18 U	18 U	18 U	18 U
TO-15	Vinyl Acetate	108-05-4	ug/m3	1.1 U	2.5	11 U	11 U	11 U	11 U
TO-15	Vinyl Chloride	75-01-4	ug/m3	0.8 U	0.8 U	7.6 U	7.6 U	7.6 U	180

Notes:
CAS = Chemical Abstracts Service.
ft = feet.
N = Normal sample.
U = Not detected.
ug/m3 = Micrograms per cubic meter.
(a) Associated total results were calculated as described in the risk assessment report text.

Attachment B

ProUCL Input/Output

Attachment B-1

Human Health Risk Assessment ProUCL Input/Output

ProUCL Input/Output
On-Project Blue Beach Area Surface Soil

On-Project Blue Beach Area Surface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_Metals|Antimony|mg/kg	D_RA_SO_Metals|Antimony|mg/kg
SO	T	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:25 AM	0 - 1 ft	0.092	1
SO	T	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:15 AM	0 - 1 ft	0.4	1
SO	T	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:05 AM	0 - 1 ft	0.097	1
SO	T	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:00 AM	0 - 1 ft	0.14	1
SO	T	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:10 AM	0 - 1 ft	0.312	1
SO	T	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:20 AM	0 - 1 ft	0.264	1
SO	T	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:00 AM	0 - 1 ft	0.07	1
SO	T	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:20 AM	0 - 1 ft	1.12	1
SO	T	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:40 AM	0 - 1 ft	0.058	1
SO	T	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:10 AM	0 - 1 ft	0.11	1
SO	T	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:30 AM	0 - 1 ft	0.133	1
SO	T	SO-OnProject_BlueBeach	SB-312	10/7/2019 10:55 AM	0 - 1 ft	0.098	1
SO	T	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:15 AM	0 - 1 ft	0.07	1
SO	T	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:40 AM	0 - 1 ft	0.072	1
SO	T	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:00 PM	0 - 1 ft	0.097	1
SO	T	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:05 PM	0 - 1 ft	0.06	1
SO	T	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:20 PM	0 - 1 ft	0.12	1
SO	T	SO-OnProject_BlueBeach	SB-318	10/7/2019 1:55 PM	0 - 1 ft	0.052	1
SO	T	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:30 PM	0 - 1 ft	0.079	1
SO	T	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:45 PM	0 - 1 ft	0.172	1
SO	T	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:40 PM	0 - 1 ft	0.447	1
SO	T	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:35 PM	0 - 1 ft	0.197	1
SO	T	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:50 PM	0 - 1 ft	0.028	1
SO	T	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:20 PM	0 - 1 ft	0.046	1
SO	T	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:00 PM	0 - 1 ft	0.185	1
SO	T	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:10 PM	0 - 1 ft	0.04	1
SO	T	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:30 AM	0 - 1 ft	3.14	1

On-Project Blue Beach Area Surface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_Metals|Cadmium|mg/kg	D_RA_SO_Metals|Cadmium|mg/kg
SO	T	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:25 AM	0 - 1 ft	2.66	1
SO	T	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:15 AM	0 - 1 ft	1.16	1
SO	T	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:05 AM	0 - 1 ft	0.16	1
SO	T	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:00 AM	0 - 1 ft	0.747	1
SO	T	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:10 AM	0 - 1 ft	1.26	1
SO	T	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:20 AM	0 - 1 ft	0.565	1
SO	T	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:00 AM	0 - 1 ft	0.227	1
SO	T	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:20 AM	0 - 1 ft	0.356	1
SO	T	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:40 AM	0 - 1 ft	1.23	1
SO	T	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:10 AM	0 - 1 ft	0.73	1
SO	T	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:30 AM	0 - 1 ft	1.12	1
SO	T	SO-OnProject_BlueBeach	SB-312	10/7/2019 10:55 AM	0 - 1 ft	0.173	1
SO	T	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:15 AM	0 - 1 ft	0.263	1
SO	T	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:40 AM	0 - 1 ft	0.292	1
SO	T	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:00 PM	0 - 1 ft	0.181	1
SO	T	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:05 PM	0 - 1 ft	0.016	1
SO	T	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:20 PM	0 - 1 ft	0.161	1
SO	T	SO-OnProject_BlueBeach	SB-318	10/7/2019 1:55 PM	0 - 1 ft	0.0885	1
SO	T	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:30 PM	0 - 1 ft	0.171	1
SO	T	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:45 PM	0 - 1 ft	0.565	1
SO	T	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:40 PM	0 - 1 ft	0.292	1
SO	T	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:35 PM	0 - 1 ft	1.13	1
SO	T	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:50 PM	0 - 1 ft	0.083	1
SO	T	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:20 PM	0 - 1 ft	0.0849	1
SO	T	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:00 PM	0 - 1 ft	0.496	1
SO	T	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:10 PM	0 - 1 ft	0.016	0
SO	T	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:30 AM	0 - 1 ft	12	1

On-Project Blue Beach Area Surface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_SVOCs_EPHs|Dibenzo(a,h)Anthracene|mg/kg	D_RA_SO_SVOCs_EPHs|Dibenzo(a,h)Anthracene|mg/kg
SO	T	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:25 AM	0 - 1 ft	0.0465	1
SO	T	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:15 AM	0 - 1 ft	0.022	1
SO	T	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:05 AM	0 - 1 ft	0.0071	1
SO	T	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:00 AM	0 - 1 ft	0.021	1
SO	T	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:10 AM	0 - 1 ft	0.053	1
SO	T	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:20 AM	0 - 1 ft	0.007	1
SO	T	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:00 AM	0 - 1 ft	0.0084	1
SO	T	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:20 AM	0 - 1 ft	0.0043	1
SO	T	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:40 AM	0 - 1 ft	0.0046	1
SO	T	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:10 AM	0 - 1 ft	0.01	0
SO	T	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:30 AM	0 - 1 ft	0.13	1
SO	T	SO-OnProject_BlueBeach	SB-312	10/7/2019 10:55 AM	0 - 1 ft	0.013	1
SO	T	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:15 AM	0 - 1 ft	0.018	1
SO	T	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:40 AM	0 - 1 ft	0.0096	1
SO	T	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:00 PM	0 - 1 ft	0.011	1
SO	T	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:05 PM	0 - 1 ft	0.01	0
SO	T	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:20 PM	0 - 1 ft	0.012	1
SO	T	SO-OnProject_BlueBeach	SB-318	10/7/2019 1:55 PM	0 - 1 ft	0.0027	1
SO	T	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:30 PM	0 - 1 ft	0.0052	1
SO	T	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:45 PM	0 - 1 ft	0.011	1
SO	T	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:40 PM	0 - 1 ft	0.016	1
SO	T	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:35 PM	0 - 1 ft	0.004	1
SO	T	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:50 PM	0 - 1 ft	0.0029	1
SO	T	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:20 PM	0 - 1 ft	0.0032	1
SO	T	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:00 PM	0 - 1 ft	0.017	1
SO	T	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:10 PM	0 - 1 ft	0.0086	0
SO	T	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:30 AM	0 - 1 ft	0.013	1

On-Project Blue Beach Area Surface Soil

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/30/2020 11:49:31 AM
From File	Input_SurfSoil.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_SO_Metals|Antimony|mg/kg

General Statistics

Total Number of Observations	27	Number of Distinct Observations	25
		Number of Missing Observations	0
Minimum	0.028	Mean	0.285
Maximum	3.14	Median	0.098
SD	0.61	Std. Error of Mean	0.117
Coefficient of Variation	2.14	Skewness	4.329

Normal GOF Test

Shapiro Wilk Test Statistic	0.408	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.923	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.337	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.167	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.485	95% Adjusted-CLT UCL (Chen-1995)	0.583
		95% Modified-t UCL (Johnson-1978)	0.502

Gamma GOF Test

A-D Test Statistic	2.519	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.783	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.243	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.175	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.773	k star (bias corrected MLE)	0.712
Theta hat (MLE)	0.369	Theta star (bias corrected MLE)	0.401
nu hat (MLE)	41.75	nu star (bias corrected)	38.45
MLE Mean (bias corrected)	0.285	MLE Sd (bias corrected)	0.338
		Approximate Chi Square Value (0.05)	25.25
Adjusted Level of Significance	0.0401	Adjusted Chi Square Value	24.56

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.434	95% Adjusted Gamma UCL (use when n<50)	0.446

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.905	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.923	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.144	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.167	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-3.576	Mean of logged Data	-2.026
Maximum of Logged Data	1.144	SD of logged Data	1.036

Assuming Lognormal Distribution

95% H-UCL	0.38	90% Chebyshev (MVUE) UCL	0.37
95% Chebyshev (MVUE) UCL	0.438	97.5% Chebyshev (MVUE) UCL	0.533
99% Chebyshev (MVUE) UCL	0.719		

On-Project Blue Beach Area Surface Soil

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.478	95% Jackknife UCL	0.485
95% Standard Bootstrap UCL	0.47	95% Bootstrap-t UCL	1.186
95% Hall's Bootstrap UCL	1.222	95% Percentile Bootstrap UCL	0.513
95% BCA Bootstrap UCL	0.639		
90% Chebyshev(Mean, Sd) UCL	0.638	95% Chebyshev(Mean, Sd) UCL	0.797
97.5% Chebyshev(Mean, Sd) UCL	1.019	99% Chebyshev(Mean, Sd) UCL	1.454

Suggested UCL to Use

95% H-UCL	0.38

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

On-Project Blue Beach Area Surface Soil

RA_SO_Metals|Cadmium|mg/kg

General Statistics

Total Number of Observations	27	Number of Distinct Observations	24
Number of Detects	26	Number of Non-Detects	1
Number of Distinct Detects	24	Number of Distinct Non-Detects	1
Minimum Detect	0.016	Minimum Non-Detect	0.016
Maximum Detect	12	Maximum Non-Detect	0.016
Variance Detects	5.367	Percent Non-Detects	3.704%
Mean Detects	1.008	SD Detects	2.317
Median Detects	0.324	CV Detects	2.298
Skewness Detects	4.614	Kurtosis Detects	22.4
Mean of Logged Detects	-0.957	SD of Logged Detects	1.326

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.389	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.92	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.38	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.17	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.971	KM Standard Error of Mean	0.439
KM SD	2.237	95% KM (BCA) UCL	1.86
95% KM (t) UCL	1.72	95% KM (Percentile Bootstrap) UCL	1.808
95% KM (z) UCL	1.694	95% KM Bootstrap t UCL	3.935
90% KM Chebyshev UCL	2.289	95% KM Chebyshev UCL	2.885
97.5% KM Chebyshev UCL	3.713	99% KM Chebyshev UCL	5.34

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.366	Anderson-Darling GOF Test	
5% A-D Critical Value	0.795	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.197	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.18	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.635	k star (bias corrected MLE)	0.587
Theta hat (MLE)	1.588	Theta star (bias corrected MLE)	1.716
nu hat (MLE)	33.02	nu star (bias corrected)	30.54
Mean (detects)	1.008		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.971
Maximum	12	Median	0.292
SD	2.28	CV	2.348
k hat (MLE)	0.584	k star (bias corrected MLE)	0.544
Theta hat (MLE)	1.664	Theta star (bias corrected MLE)	1.787
nu hat (MLE)	31.52	nu star (bias corrected)	29.35
Adjusted Level of Significance (β)	0.0401		
Approximate Chi Square Value (29.35, α)	17.98	Adjusted Chi Square Value (29.35, β)	17.41
95% Gamma Approximate UCL (use when n>=50)	1.585	95% Gamma Adjusted UCL (use when n<50)	1.637

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.971	SD (KM)	2.237
Variance (KM)	5.005	SE of Mean (KM)	0.439
k hat (KM)	0.189	k star (KM)	0.192
nu hat (KM)	10.18	nu star (KM)	10.38
theta hat (KM)	5.152	theta star (KM)	5.052
80% gamma percentile (KM)	1.253	90% gamma percentile (KM)	2.936
95% gamma percentile (KM)	5.056	99% gamma percentile (KM)	10.93

On-Project Blue Beach Area Surface Soil

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (10.38, α)	4.182	Adjusted Chi Square Value (10.38, β)	3.933
95% Gamma Approximate KM-UCL (use when n>=50)	2.411	95% Gamma Adjusted KM-UCL (use when n<50)	2.564
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.971	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.92	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.108	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.17	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.971	Mean in Log Scale	-1.078
SD in Original Scale	2.28	SD in Log Scale	1.443
95% t UCL (assumes normality of ROS data)	1.72	95% Percentile Bootstrap UCL	1.799
95% BCA Bootstrap UCL	2.345	95% Bootstrap t UCL	3.847
95% H-UCL (Log ROS)	2.354		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-1.075	KM Geo Mean	0.341
KM SD (logged)	1.41	95% Critical H Value (KM-Log)	3.1
KM Standard Error of Mean (logged)	0.277	95% H-UCL (KM -Log)	2.173
KM SD (logged)	1.41	95% Critical H Value (KM-Log)	3.1
KM Standard Error of Mean (logged)	0.277		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.971	Mean in Log Scale	-1.1
SD in Original Scale	2.28	SD in Log Scale	1.498
95% t UCL (Assumes normality)	1.719	95% H-Stat UCL	2.646
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Level			
Suggested UCL to Use			
KM H-UCL	2.173		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Surface Soil

RA_SO_SVOCs_EPHs|Dibenzo(a,h)Anthracene|mg/kg

General Statistics

Total Number of Observations	27	Number of Distinct Observations	24
Number of Detects	24	Number of Non-Detects	3
Number of Distinct Detects	22	Number of Distinct Non-Detects	2
Minimum Detect	0.0027	Minimum Non-Detect	0.0086
Maximum Detect	0.13	Maximum Non-Detect	0.01
Variance Detects	7.2180E-4	Percent Non-Detects	11.11%
Mean Detects	0.0184	SD Detects	0.0269
Median Detects	0.011	CV Detects	1.457
Skewness Detects	3.483	Kurtosis Detects	13.62
Mean of Logged Detects	-4.522	SD of Logged Detects	0.959

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.553	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.916	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.322	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.177	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.017	KM Standard Error of Mean	0.00495
KM SD	0.0252	95% KM (BCA) UCL	0.0261
95% KM (t) UCL	0.0254	95% KM (Percentile Bootstrap) UCL	0.026
95% KM (z) UCL	0.0251	95% KM Bootstrap t UCL	0.0386
90% KM Chebyshev UCL	0.0318	95% KM Chebyshev UCL	0.0385
97.5% KM Chebyshev UCL	0.0479	99% KM Chebyshev UCL	0.0662

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.092	Anderson-Darling GOF Test	
5% A-D Critical Value	0.77	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.18	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.183	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.082	k star (bias corrected MLE)	0.974
Theta hat (MLE)	0.017	Theta star (bias corrected MLE)	0.0189
nu hat (MLE)	51.93	nu star (bias corrected)	46.77
Mean (detects)	0.0184		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0027	Mean	0.0175
Maximum	0.13	Median	0.01
SD	0.0254	CV	1.452
k hat (MLE)	1.168	k star (bias corrected MLE)	1.063
Theta hat (MLE)	0.015	Theta star (bias corrected MLE)	0.0165
nu hat (MLE)	63.06	nu star (bias corrected)	57.39
Adjusted Level of Significance (β)	0.0401		
Approximate Chi Square Value (57.39, α)	40.97	Adjusted Chi Square Value (57.39, β)	40.09
95% Gamma Approximate UCL (use when n>=50)	0.0245	95% Gamma Adjusted UCL (use when n<50)	0.0251

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.017	SD (KM)	0.0252
Variance (KM)	6.3267E-4	SE of Mean (KM)	0.00495
k hat (KM)	0.455	k star (KM)	0.429
nu hat (KM)	24.57	nu star (KM)	23.17
theta hat (KM)	0.0373	theta star (KM)	0.0395
80% gamma percentile (KM)	0.0276	90% gamma percentile (KM)	0.0473
95% gamma percentile (KM)	0.0688	99% gamma percentile (KM)	0.122

On-Project Blue Beach Area Surface Soil

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (23.17, α)	13.22	Adjusted Chi Square Value (23.17, β)	12.74
95% Gamma Approximate KM-UCL (use when n>=50)	0.0297	95% Gamma Adjusted KM-UCL (use when n<50)	0.0309
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.952	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.916	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.106	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.177	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.017	Mean in Log Scale	-4.61
SD in Original Scale	0.0256	SD in Log Scale	0.94
95% t UCL (assumes normality of ROS data)	0.0254	95% Percentile Bootstrap UCL	0.0258
95% BCA Bootstrap UCL	0.0292	95% Bootstrap t UCL	0.0362
95% H-UCL (Log ROS)	0.0243		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-4.613	KM Geo Mean	0.00992
KM SD (logged)	0.932	95% Critical H Value (KM-Log)	2.433
KM Standard Error of Mean (logged)	0.185	95% H-UCL (KM -Log)	0.0239
KM SD (logged)	0.932	95% Critical H Value (KM-Log)	2.433
KM Standard Error of Mean (logged)	0.185		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0169	Mean in Log Scale	-4.614
SD in Original Scale	0.0256	SD in Log Scale	0.941
95% t UCL (Assumes normality)	0.0253	95% H-Stat UCL	0.0242
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Approximate Gamma Distributed at 5% Significance Level			
Suggested UCL to Use			
Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	0.0309		
When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test			
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL			
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			

ProUCL Input/Output
Off-Project Red Maple Swamp / Tidal Stream Area Surface Soil

Off-Project Red Maple Swamp/Tidal Stream Area Surface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_Pest_PCBs|Total PCB Aroclors|mg/kg	D_RA_SO_Pest_PCBs|Total PCB Aroclors|mg/kg
SO	T	SO-OffProject_RedMapleSwamp	SB-327	10/3/2019 8:45 AM	0 - 1 ft	0.062	0
SO	T	SO-OffProject_RedMapleSwamp	SB-328	10/3/2019 9:00 AM	0 - 1 ft	0.069	0
SO	T	SO-OffProject_RedMapleSwamp	SB-329	10/3/2019 9:20 AM	0 - 1 ft	0.25	1
SO	T	SO-OffProject_RedMapleSwamp	SB-330	10/3/2019 9:30 AM	0 - 1 ft	0.058	0
SO	T	SO-OffProject_RedMapleSwamp	SB-331	10/3/2019 9:45 AM	0 - 1 ft	0.13	1
SO	T	SO-OffProject_RedMapleSwamp	SB-332	10/3/2019 10:00 AM	0 - 1 ft	0.062	0
SO	T	SO-OffProject_RedMapleSwamp	SB-333	10/3/2019 10:15 AM	0 - 1 ft	0.11	1
SO	T	SO-OffProject_RedMapleSwamp	SB-334	10/3/2019 10:30 AM	0 - 1 ft	0.06	0
SO	T	SO-OffProject_RedMapleSwamp	SB-335	10/3/2019 10:45 AM	0 - 1 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-336	10/3/2019 11:00 AM	0 - 1 ft	0.061	0
SO	T	SO-OffProject_RedMapleSwamp	SS-1A	11/30/2011 12:00 AM	0 - 1 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-2A	11/30/2011 12:00 AM	0 - 1 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-3A	11/30/2011 12:00 AM	0 - 1 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-4A	11/30/2011 12:00 AM	0 - 1 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-5A	11/30/2011 12:00 AM	0 - 1 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-6A	11/30/2011 12:00 AM	0 - 1 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Surface Soil

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/30/2020 11:50:33 AM
From File	Input_SurfSoil_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_SO_Pest_PCBs|Total PCB Aroclors|mg/kg

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
		Number of Missing Observations	1
Number of Detects	3	Number of Non-Detects	6
Number of Distinct Detects	3	Number of Distinct Non-Detects	5
Minimum Detect	0.11	Minimum Non-Detect	0.058
Maximum Detect	0.25	Maximum Non-Detect	0.069
Variance Detects	0.00573	Percent Non-Detects	66.67%
Mean Detects	0.163	SD Detects	0.0757
Median Detects	0.13	CV Detects	0.464
Skewness Detects	1.597	Kurtosis Detects	N/A
Mean of Logged Detects	-1.878	SD of Logged Detects	0.434

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.855	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.337	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0931	KM Standard Error of Mean	0.025
KM SD	0.0612	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.14	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.134	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.168	95% KM Chebyshev UCL	0.202
97.5% KM Chebyshev UCL	0.249	99% KM Chebyshev UCL	0.342

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	7.742	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0211	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	46.45	nu star (bias corrected)	N/A
Mean (detects)	0.163		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0611
Maximum	0.25	Median	0.01
SD	0.0855	CV	1.399

Off-Project Red Maple Swamp/Tidal Stream Area Surface Soil

k hat (MLE)	0.674	k star (bias corrected MLE)	0.524
Theta hat (MLE)	0.0906	Theta star (bias corrected MLE)	0.117
nu hat (MLE)	12.14	nu star (bias corrected)	9.425
Adjusted Level of Significance (β)	0.0231		
Approximate Chi Square Value (9.42, α)	3.585	Adjusted Chi Square Value (9.42, β)	2.868
95% Gamma Approximate UCL (use when n>=50)	0.161	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0931	SD (KM)	0.0612
Variance (KM)	0.00374	SE of Mean (KM)	0.025
k hat (KM)	2.318	k star (KM)	1.62
nu hat (KM)	41.73	nu star (KM)	29.15
theta hat (KM)	0.0402	theta star (KM)	0.0575
80% gamma percentile (KM)	0.143	90% gamma percentile (KM)	0.19
95% gamma percentile (KM)	0.236	99% gamma percentile (KM)	0.34

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (29.15, α)	17.83	Adjusted Chi Square Value (29.15, β)	15.99
95% Gamma Approximate KM-UCL (use when n>=50)	0.152	95% Gamma Adjusted KM-UCL (use when n<50)	0.17

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.895	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.312	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0732	Mean in Log Scale	-3.022
SD in Original Scale	0.0777	SD in Log Scale	0.904
95% t UCL (assumes normality of ROS data)	0.121	95% Percentile Bootstrap UCL	0.118
95% BCA Bootstrap UCL	0.125	95% Bootstrap t UCL	0.175
95% H-UCL (Log ROS)	0.193		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.524	KM Geo Mean	0.0801
KM SD (logged)	0.501	95% Critical H Value (KM-Log)	2.228
KM Standard Error of Mean (logged)	0.204	95% H-UCL (KM -Log)	0.135
KM SD (logged)	0.501	95% Critical H Value (KM-Log)	2.228
KM Standard Error of Mean (logged)	0.204		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0751	Mean in Log Scale	-2.943
SD in Original Scale	0.0762	SD in Log Scale	0.829
95% t UCL (Assumes normality)	0.122	95% H-Stat UCL	0.172

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use
95% KM (t) UCL 0.14

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL Input/Output
On-Project Blue Beach Area Subsurface Soil

On-Project Blue Beach Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_Metals|Antimony|mg/kg	D_RA_SO_Metals|Antimony|mg/kg
SO	T	SO-OnProject_BlueBeach	EA20VP	3/14/2006 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	EA27VP	3/14/2006 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	GP2-TR1B 6-6.5	11/17/2011 12:00 AM	6 - 6.5 ft		
SO	T	SO-OnProject_BlueBeach	GP2-TR2A 6-7	11/17/2011 12:00 AM	6 - 7 ft		
SO	T	SO-OnProject_BlueBeach	GP2-TR2D 6-7	11/17/2011 12:00 AM	6 - 7 ft		
SO	T	SO-OnProject_BlueBeach	GP-TR1 5-7	11/16/2011 12:00 AM	5 - 7 ft		
SO	T	SO-OnProject_BlueBeach	GP-TR2 6-8	11/16/2011 12:00 AM	6 - 8 ft		
SO	T	SO-OnProject_BlueBeach	GP-TR3B 6-6.5	11/16/2011 12:00 AM	6 - 6.5 ft		
SO	T	SO-OnProject_BlueBeach	SB-101	11/16/2011 12:00 AM	0 - 4 ft		
SO	T	SO-OnProject_BlueBeach	SB-101	11/16/2011 12:00 AM	4 - 6 ft		
SO	T	SO-OnProject_BlueBeach	SB-102	11/16/2011 12:00 AM	5 - 7 ft		
SO	T	SO-OnProject_BlueBeach	SB-103	11/16/2011 12:00 AM	0 - 4 ft		
SO	T	SO-OnProject_BlueBeach	SB-103	11/16/2011 12:00 AM	4 - 6 ft		
SO	T	SO-OnProject_BlueBeach	SB-104	11/16/2011 12:00 AM	5 - 7 ft		
SO	T	SO-OnProject_BlueBeach	SB-105	11/16/2011 12:00 AM	8 - 10 ft		
SO	T	SO-OnProject_BlueBeach	SB-105	11/16/2011 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-107	11/18/2011 12:00 AM	7 - 9 ft		
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	0 - 4 ft		
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	10 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	10 - 14 ft		
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	4 - 8 ft		
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:30 AM	1 - 3 ft	0.105	1
SO	T	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:20 AM	1 - 3 ft	0.036	1
SO	T	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:10 AM	1 - 3 ft	0.14	1
SO	T	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:05 AM	1 - 3 ft	0.179	1
SO	T	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:15 AM	1 - 3 ft	0.212	1
SO	T	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:25 AM	1 - 3 ft	0.13	1
SO	T	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:05 AM	1 - 3 ft	0.084	1
SO	T	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:25 AM	1 - 3 ft	0.467	1
SO	T	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:45 AM	1 - 3 ft	0.041	1
SO	T	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:15 AM	1 - 3 ft	0.085	1
SO	T	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:35 AM	1 - 3 ft	0.164	1
SO	T	SO-OnProject_BlueBeach	SB-312	10/7/2019 11:00 AM	1 - 3 ft	0.049	1
SO	T	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:20 AM	1 - 3 ft	0.1	1
SO	T	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:45 AM	1 - 3 ft	0.056	1
SO	T	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:05 PM	1 - 3 ft	0.026	1
SO	T	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:10 PM	1 - 3 ft	0.035	1
SO	T	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:25 PM	1 - 3 ft	0.017	1
SO	T	SO-OnProject_BlueBeach	SB-318	10/7/2019 2:00 PM	1 - 3 ft	0.038	0
SO	T	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:35 PM	1 - 3 ft	0.11	1
SO	T	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:50 PM	1 - 3 ft	0.043	1
SO	T	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:45 PM	1 - 3 ft	0.17	1
SO	T	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:40 PM	1 - 3 ft	1.12	1
SO	T	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:55 PM	1 - 3 ft	0.048	1
SO	T	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:25 PM	1 - 3 ft	0.087	1
SO	T	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:05 PM	1 - 3 ft	0.03	1
SO	T	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:15 PM	1 - 3 ft	0.022	1
SO	T	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:35 AM	1 - 3 ft	3.75	1
SO	T	SO-OnProject_BlueBeach	UVF-18	11/22/2010 12:00 AM	14.25 - 15.5 ft		

On-Project Blue Beach Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_Metals|Cadmium|mg/kg	D_RA_SO_Metals|Cadmium|mg/kg
SO	T	SO-OnProject_BlueBeach	EA20VP	3/14/2006 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	EA27VP	3/14/2006 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	GP2-TR1B 6-6.5	11/17/2011 12:00 AM	6 - 6.5 ft	0.5	0
SO	T	SO-OnProject_BlueBeach	GP2-TR2A 6-7	11/17/2011 12:00 AM	6 - 7 ft	0.7	1
SO	T	SO-OnProject_BlueBeach	GP2-TR2D 6-7	11/17/2011 12:00 AM	6 - 7 ft	0.7	1
SO	T	SO-OnProject_BlueBeach	GP-TR1 5-7	11/16/2011 12:00 AM	5 - 7 ft		
SO	T	SO-OnProject_BlueBeach	GP-TR2 6-8	11/16/2011 12:00 AM	6 - 8 ft	0.1	1
SO	T	SO-OnProject_BlueBeach	GP-TR3B 6-6.5	11/16/2011 12:00 AM	6 - 6.5 ft	0.2	1
SO	T	SO-OnProject_BlueBeach	SB-101	11/16/2011 12:00 AM	0 - 4 ft	0.5	0
SO	T	SO-OnProject_BlueBeach	SB-101	11/16/2011 12:00 AM	4 - 6 ft		
SO	T	SO-OnProject_BlueBeach	SB-102	11/16/2011 12:00 AM	5 - 7 ft		
SO	T	SO-OnProject_BlueBeach	SB-103	11/16/2011 12:00 AM	0 - 4 ft	0.5	0
SO	T	SO-OnProject_BlueBeach	SB-103	11/16/2011 12:00 AM	4 - 6 ft		
SO	T	SO-OnProject_BlueBeach	SB-104	11/16/2011 12:00 AM	5 - 7 ft		
SO	T	SO-OnProject_BlueBeach	SB-105	11/16/2011 12:00 AM	8 - 10 ft		
SO	T	SO-OnProject_BlueBeach	SB-105	11/16/2011 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-107	11/18/2011 12:00 AM	7 - 9 ft		
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	0 - 4 ft	0.2	1
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	10 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	10 - 14 ft		
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	4 - 8 ft	0.5	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	8 - 12 ft	0.1	1
SO	T	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:30 AM	1 - 3 ft	2.54	1
SO	T	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:20 AM	1 - 3 ft	0.0921	1
SO	T	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:10 AM	1 - 3 ft	0.303	1
SO	T	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:05 AM	1 - 3 ft	2.83	1
SO	T	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:15 AM	1 - 3 ft	2.39	1
SO	T	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:25 AM	1 - 3 ft	1.53	1
SO	T	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:05 AM	1 - 3 ft	0.411	1
SO	T	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:25 AM	1 - 3 ft	0.626	1
SO	T	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:45 AM	1 - 3 ft	0.0829	1
SO	T	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:15 AM	1 - 3 ft	0.175	1
SO	T	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:35 AM	1 - 3 ft	0.646	1
SO	T	SO-OnProject_BlueBeach	SB-312	10/7/2019 11:00 AM	1 - 3 ft	0.699	1
SO	T	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:20 AM	1 - 3 ft	0.057	1
SO	T	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:45 AM	1 - 3 ft	0.226	1
SO	T	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:05 PM	1 - 3 ft	0.0992	1
SO	T	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:10 PM	1 - 3 ft	0.02	1
SO	T	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:25 PM	1 - 3 ft	0.12	1
SO	T	SO-OnProject_BlueBeach	SB-318	10/7/2019 2:00 PM	1 - 3 ft	0.028	1
SO	T	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:35 PM	1 - 3 ft	0.167	1
SO	T	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:50 PM	1 - 3 ft	0.23	1
SO	T	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:45 PM	1 - 3 ft	2.46	1
SO	T	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:40 PM	1 - 3 ft	4.22	1
SO	T	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:55 PM	1 - 3 ft	0.255	1
SO	T	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:25 PM	1 - 3 ft	1.37	1
SO	T	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:05 PM	1 - 3 ft	0.0644	1
SO	T	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:15 PM	1 - 3 ft	0.015	0
SO	T	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:35 AM	1 - 3 ft	9.06	1
SO	T	SO-OnProject_BlueBeach	UVF-18	11/22/2010 12:00 AM	14.25 - 15.5 ft		

On-Project Blue Beach Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_VOCs_VPHs|1,2,4-Trimethylbenzene|mg/kg	D_RA_SO_VOCs_VPHs|1,2,4-Trimethylbenzene|mg/kg
SO	T	SO-OnProject_BlueBeach	EA20VP	3/14/2006 12:00 AM	8 - 12 ft	0.21	0
SO	T	SO-OnProject_BlueBeach	EA27VP	3/14/2006 12:00 AM	8 - 12 ft	0.001	0
SO	T	SO-OnProject_BlueBeach	GP2-TR1B 6-6.5	11/17/2011 12:00 AM	6 - 6.5 ft	0.0043	0
SO	T	SO-OnProject_BlueBeach	GP2-TR2A 6-7	11/17/2011 12:00 AM	6 - 7 ft	0.0042	0
SO	T	SO-OnProject_BlueBeach	GP2-TR2D 6-7	11/17/2011 12:00 AM	6 - 7 ft	0.0041	0
SO	T	SO-OnProject_BlueBeach	GP-TR1 5-7	11/16/2011 12:00 AM	5 - 7 ft	63.3	1
SO	T	SO-OnProject_BlueBeach	GP-TR2 6-8	11/16/2011 12:00 AM	6 - 8 ft	14.2	1
SO	T	SO-OnProject_BlueBeach	GP-TR3B 6-6.5	11/16/2011 12:00 AM	6 - 6.5 ft	12.4	1
SO	T	SO-OnProject_BlueBeach	SB-101	11/16/2011 12:00 AM	0 - 4 ft		
SO	T	SO-OnProject_BlueBeach	SB-101	11/16/2011 12:00 AM	4 - 6 ft	0.0015	1
SO	T	SO-OnProject_BlueBeach	SB-102	11/16/2011 12:00 AM	5 - 7 ft	0.0039	1
SO	T	SO-OnProject_BlueBeach	SB-103	11/16/2011 12:00 AM	0 - 4 ft		
SO	T	SO-OnProject_BlueBeach	SB-103	11/16/2011 12:00 AM	4 - 6 ft	0.0066	1
SO	T	SO-OnProject_BlueBeach	SB-104	11/16/2011 12:00 AM	5 - 7 ft	0.0052	1
SO	T	SO-OnProject_BlueBeach	SB-105	11/16/2011 12:00 AM	8 - 10 ft	0.0037	0
SO	T	SO-OnProject_BlueBeach	SB-105	11/16/2011 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-107	11/18/2011 12:00 AM	7 - 9 ft	0.0053	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	0 - 4 ft	0.005	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	10 - 12 ft	0.0044	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	10 - 14 ft		
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	4 - 8 ft	0.0041	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:30 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:20 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:10 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:05 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:15 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:25 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:05 AM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:25 AM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:45 AM	1 - 3 ft	0.0022	0
SO	T	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:15 AM	1 - 3 ft	0.0024	0
SO	T	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:35 AM	1 - 3 ft	0.0021	0
SO	T	SO-OnProject_BlueBeach	SB-312	10/7/2019 11:00 AM	1 - 3 ft	0.0024	0
SO	T	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:20 AM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:45 AM	1 - 3 ft	0.0024	0
SO	T	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:05 PM	1 - 3 ft	0.0023	0
SO	T	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:10 PM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:25 PM	1 - 3 ft	0.0023	0
SO	T	SO-OnProject_BlueBeach	SB-318	10/7/2019 2:00 PM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:35 PM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:50 PM	1 - 3 ft	0.0023	0
SO	T	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:45 PM	1 - 3 ft	0.0022	0
SO	T	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:40 PM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:55 PM	1 - 3 ft	0.0022	0
SO	T	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:25 PM	1 - 3 ft	0.0012	0
SO	T	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:05 PM	1 - 3 ft	0.0032	0
SO	T	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:15 PM	1 - 3 ft	0.0028	0
SO	T	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:35 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	UVF-18	11/22/2010 12:00 AM	14.25 - 15.5 ft		

On-Project Blue Beach Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_VOCs_VPHs|Ethylbenzene|mg/kg	D_RA_SO_VOCs_VPHs|Ethylbenzene|mg/kg
SO	T	SO-OnProject_BlueBeach	EA20VP	3/14/2006 12:00 AM	8 - 12 ft	0.21	0
SO	T	SO-OnProject_BlueBeach	EA27VP	3/14/2006 12:00 AM	8 - 12 ft	0.001	0
SO	T	SO-OnProject_BlueBeach	GP2-TR1B 6-6.5	11/17/2011 12:00 AM	6 - 6.5 ft	0.0021	1
SO	T	SO-OnProject_BlueBeach	GP2-TR2A 6-7	11/17/2011 12:00 AM	6 - 7 ft	0.0023	1
SO	T	SO-OnProject_BlueBeach	GP2-TR2D 6-7	11/17/2011 12:00 AM	6 - 7 ft	0.0021	1
SO	T	SO-OnProject_BlueBeach	GP-TR1 5-7	11/16/2011 12:00 AM	5 - 7 ft	1.89	1
SO	T	SO-OnProject_BlueBeach	GP-TR2 6-8	11/16/2011 12:00 AM	6 - 8 ft	77.9	1
SO	T	SO-OnProject_BlueBeach	GP-TR3B 6-6.5	11/16/2011 12:00 AM	6 - 6.5 ft	0.321	1
SO	T	SO-OnProject_BlueBeach	SB-101	11/16/2011 12:00 AM	0 - 4 ft		
SO	T	SO-OnProject_BlueBeach	SB-101	11/16/2011 12:00 AM	4 - 6 ft	0.0022	0
SO	T	SO-OnProject_BlueBeach	SB-102	11/16/2011 12:00 AM	5 - 7 ft	0.004	0
SO	T	SO-OnProject_BlueBeach	SB-103	11/16/2011 12:00 AM	0 - 4 ft		
SO	T	SO-OnProject_BlueBeach	SB-103	11/16/2011 12:00 AM	4 - 6 ft	0.0034	0
SO	T	SO-OnProject_BlueBeach	SB-104	11/16/2011 12:00 AM	5 - 7 ft	0.0027	0
SO	T	SO-OnProject_BlueBeach	SB-105	11/16/2011 12:00 AM	8 - 10 ft	0.0037	0
SO	T	SO-OnProject_BlueBeach	SB-105	11/16/2011 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-107	11/18/2011 12:00 AM	7 - 9 ft	0.0053	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	0 - 4 ft	0.005	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	10 - 12 ft	0.0044	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	10 - 14 ft		
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	4 - 8 ft	0.0041	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:30 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:20 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:10 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:05 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:15 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:25 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:05 AM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:25 AM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:45 AM	1 - 3 ft	0.0022	0
SO	T	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:15 AM	1 - 3 ft	0.0024	0
SO	T	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:35 AM	1 - 3 ft	0.0021	0
SO	T	SO-OnProject_BlueBeach	SB-312	10/7/2019 11:00 AM	1 - 3 ft	0.0024	0
SO	T	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:20 AM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:45 AM	1 - 3 ft	0.0024	0
SO	T	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:05 PM	1 - 3 ft	0.0023	0
SO	T	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:10 PM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:25 PM	1 - 3 ft	0.0023	0
SO	T	SO-OnProject_BlueBeach	SB-318	10/7/2019 2:00 PM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:35 PM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:50 PM	1 - 3 ft	0.0023	0
SO	T	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:45 PM	1 - 3 ft	0.0022	0
SO	T	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:40 PM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:55 PM	1 - 3 ft	0.0022	0
SO	T	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:25 PM	1 - 3 ft	0.0012	0
SO	T	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:05 PM	1 - 3 ft	0.0032	0
SO	T	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:15 PM	1 - 3 ft	0.0028	0
SO	T	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:35 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	UVF-18	11/22/2010 12:00 AM	14.25 - 15.5 ft	0.22	0

On-Project Blue Beach Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_VOCs_VPHs|Total Xylenes|mg/kg	D_RA_SO_VOCs_VPHs|Total Xylenes|mg/kg
SO	T	SO-OnProject_BlueBeach	EA20VP	3/14/2006 12:00 AM	8 - 12 ft	0.63	0
SO	T	SO-OnProject_BlueBeach	EA27VP	3/14/2006 12:00 AM	8 - 12 ft	0.004	0
SO	T	SO-OnProject_BlueBeach	GP2-TR1B 6-6.5	11/17/2011 12:00 AM	6 - 6.5 ft	0.017	1
SO	T	SO-OnProject_BlueBeach	GP2-TR2A 6-7	11/17/2011 12:00 AM	6 - 7 ft	0.017	1
SO	T	SO-OnProject_BlueBeach	GP2-TR2D 6-7	11/17/2011 12:00 AM	6 - 7 ft	0.016	1
SO	T	SO-OnProject_BlueBeach	GP-TR1 5-7	11/16/2011 12:00 AM	5 - 7 ft	9.2	1
SO	T	SO-OnProject_BlueBeach	GP-TR2 6-8	11/16/2011 12:00 AM	6 - 8 ft	490	1
SO	T	SO-OnProject_BlueBeach	GP-TR3B 6-6.5	11/16/2011 12:00 AM	6 - 6.5 ft	1.7	1
SO	T	SO-OnProject_BlueBeach	SB-101	11/16/2011 12:00 AM	0 - 4 ft		
SO	T	SO-OnProject_BlueBeach	SB-101	11/16/2011 12:00 AM	4 - 6 ft	0.0065	0
SO	T	SO-OnProject_BlueBeach	SB-102	11/16/2011 12:00 AM	5 - 7 ft	0.012	0
SO	T	SO-OnProject_BlueBeach	SB-103	11/16/2011 12:00 AM	0 - 4 ft		
SO	T	SO-OnProject_BlueBeach	SB-103	11/16/2011 12:00 AM	4 - 6 ft	0.01	0
SO	T	SO-OnProject_BlueBeach	SB-104	11/16/2011 12:00 AM	5 - 7 ft	0.0081	0
SO	T	SO-OnProject_BlueBeach	SB-105	11/16/2011 12:00 AM	8 - 10 ft	0.011	0
SO	T	SO-OnProject_BlueBeach	SB-105	11/16/2011 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-107	11/18/2011 12:00 AM	7 - 9 ft	0.016	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	0 - 4 ft	0.015	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	10 - 12 ft	0.013	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	10 - 14 ft		
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	4 - 8 ft	0.012	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:30 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:20 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:10 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:05 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:15 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:25 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:05 AM	1 - 3 ft	0.0075	0
SO	T	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:25 AM	1 - 3 ft	0.0065	1
SO	T	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:45 AM	1 - 3 ft	0.0066	0
SO	T	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:15 AM	1 - 3 ft	0.0072	0
SO	T	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:35 AM	1 - 3 ft	0.0063	0
SO	T	SO-OnProject_BlueBeach	SB-312	10/7/2019 11:00 AM	1 - 3 ft	0.0072	0
SO	T	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:20 AM	1 - 3 ft	0.0075	0
SO	T	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:45 AM	1 - 3 ft	0.0072	0
SO	T	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:05 PM	1 - 3 ft	0.0069	0
SO	T	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:10 PM	1 - 3 ft	0.0075	0
SO	T	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:25 PM	1 - 3 ft	0.0069	0
SO	T	SO-OnProject_BlueBeach	SB-318	10/7/2019 2:00 PM	1 - 3 ft	0.0075	0
SO	T	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:35 PM	1 - 3 ft	0.0075	0
SO	T	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:50 PM	1 - 3 ft	0.0069	0
SO	T	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:45 PM	1 - 3 ft	0.0066	0
SO	T	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:40 PM	1 - 3 ft	0.0075	0
SO	T	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:55 PM	1 - 3 ft	0.0065	0
SO	T	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:25 PM	1 - 3 ft	0.0036	0
SO	T	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:05 PM	1 - 3 ft	0.0097	0
SO	T	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:15 PM	1 - 3 ft	0.0083	0
SO	T	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:35 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	UVF-18	11/22/2010 12:00 AM	14.25 - 15.5 ft	0.66	0

On-Project Blue Beach Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_VOCs_VPHs|Trichloroethylene|mg/kg	D_RA_SO_VOCs_VPHs|Trichloroethylene|mg/kg
SO	T	SO-OnProject_BlueBeach	EA20VP	3/14/2006 12:00 AM	8 - 12 ft	0.21	0
SO	T	SO-OnProject_BlueBeach	EA27VP	3/14/2006 12:00 AM	8 - 12 ft	0.001	0
SO	T	SO-OnProject_BlueBeach	GP2-TR1B 6-6.5	11/17/2011 12:00 AM	6 - 6.5 ft	0.0018	1
SO	T	SO-OnProject_BlueBeach	GP2-TR2A 6-7	11/17/2011 12:00 AM	6 - 7 ft	0.0034	1
SO	T	SO-OnProject_BlueBeach	GP2-TR2D 6-7	11/17/2011 12:00 AM	6 - 7 ft	0.0058	1
SO	T	SO-OnProject_BlueBeach	GP-TR1 5-7	11/16/2011 12:00 AM	5 - 7 ft	2.14	1
SO	T	SO-OnProject_BlueBeach	GP-TR2 6-8	11/16/2011 12:00 AM	6 - 8 ft	2.58	1
SO	T	SO-OnProject_BlueBeach	GP-TR3B 6-6.5	11/16/2011 12:00 AM	6 - 6.5 ft	0.715	1
SO	T	SO-OnProject_BlueBeach	SB-101	11/16/2011 12:00 AM	0 - 4 ft		
SO	T	SO-OnProject_BlueBeach	SB-101	11/16/2011 12:00 AM	4 - 6 ft	0.0022	0
SO	T	SO-OnProject_BlueBeach	SB-102	11/16/2011 12:00 AM	5 - 7 ft	0.004	0
SO	T	SO-OnProject_BlueBeach	SB-103	11/16/2011 12:00 AM	0 - 4 ft		
SO	T	SO-OnProject_BlueBeach	SB-103	11/16/2011 12:00 AM	4 - 6 ft	0.0034	0
SO	T	SO-OnProject_BlueBeach	SB-104	11/16/2011 12:00 AM	5 - 7 ft	0.0027	0
SO	T	SO-OnProject_BlueBeach	SB-105	11/16/2011 12:00 AM	8 - 10 ft	0.0037	0
SO	T	SO-OnProject_BlueBeach	SB-105	11/16/2011 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-107	11/18/2011 12:00 AM	7 - 9 ft	0.0053	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	0 - 4 ft	0.005	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	10 - 12 ft	0.0044	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	10 - 14 ft		
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	4 - 8 ft	0.0041	0
SO	T	SO-OnProject_BlueBeach	SB-108	11/18/2011 12:00 AM	8 - 12 ft		
SO	T	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:30 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:20 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:10 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:05 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:15 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:25 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:05 AM	1 - 3 ft	0.021	1
SO	T	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:25 AM	1 - 3 ft	0.0091	1
SO	T	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:45 AM	1 - 3 ft	0.0072	1
SO	T	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:15 AM	1 - 3 ft	0.0024	0
SO	T	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:35 AM	1 - 3 ft	0.0021	0
SO	T	SO-OnProject_BlueBeach	SB-312	10/7/2019 11:00 AM	1 - 3 ft	0.0024	0
SO	T	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:20 AM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:45 AM	1 - 3 ft	0.0024	0
SO	T	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:05 PM	1 - 3 ft	0.0023	0
SO	T	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:10 PM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:25 PM	1 - 3 ft	0.0023	0
SO	T	SO-OnProject_BlueBeach	SB-318	10/7/2019 2:00 PM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:35 PM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:50 PM	1 - 3 ft	0.0023	0
SO	T	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:45 PM	1 - 3 ft	0.0022	0
SO	T	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:40 PM	1 - 3 ft	0.0025	0
SO	T	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:55 PM	1 - 3 ft	0.0022	0
SO	T	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:25 PM	1 - 3 ft	0.0012	0
SO	T	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:05 PM	1 - 3 ft	0.0032	0
SO	T	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:15 PM	1 - 3 ft	0.0028	0
SO	T	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:35 AM	1 - 3 ft		
SO	T	SO-OnProject_BlueBeach	UVF-18	11/22/2010 12:00 AM	14.25 - 15.5 ft		

On-Project Blue Beach Area Subsurface Soil

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.110/2/2020 8:45:39 AM
From File	Input_SubsurfSoil.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_SO_Metals|Antimony|mg/kg

General Statistics

Total Number of Observations	27	Number of Distinct Observations	27
		Number of Missing Observations	22
Number of Detects	26	Number of Non-Detects	1
Number of Distinct Detects	26	Number of Distinct Non-Detects	1
Minimum Detect	0.017	Minimum Non-Detect	0.038
Maximum Detect	3.75	Maximum Non-Detect	0.038
Variance Detects	0.549	Percent Non-Detects	3.704%
Mean Detects	0.281	SD Detects	0.741
Median Detects	0.086	CV Detects	2.637
Skewness Detects	4.489	Kurtosis Detects	21.15
Mean of Logged Detects	-2.359	SD of Logged Detects	1.212

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.359	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.92	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.422	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.17	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.272	KM Standard Error of Mean	0.14
KM SD	0.715	95% KM (BCA) UCL	0.552
95% KM (t) UCL	0.511	95% KM (Percentile Bootstrap) UCL	0.531
95% KM (z) UCL	0.502	95% KM Bootstrap t UCL	1.757
90% KM Chebyshev UCL	0.692	95% KM Chebyshev UCL	0.883
97.5% KM Chebyshev UCL	1.147	99% KM Chebyshev UCL	1.667

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.828	Anderson-Darling GOF Test	
5% A-D Critical Value	0.802	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.291	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.18	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.571	k star (bias corrected MLE)	0.531
Theta hat (MLE)	0.492	Theta star (bias corrected MLE)	0.529
nu hat (MLE)	29.71	nu star (bias corrected)	27.61
Mean (detects)	0.281		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.271
Maximum	3.75	Median	0.085
SD	0.728	CV	2.688
k hat (MLE)	0.551	k star (bias corrected MLE)	0.514
Theta hat (MLE)	0.492	Theta star (bias corrected MLE)	0.527
nu hat (MLE)	29.74	nu star (bias corrected)	27.77
Adjusted Level of Significance (β)	0.0401		
Approximate Chi Square Value (27.77, α)	16.75	Adjusted Chi Square Value (27.77, β)	16.2

On-Project Blue Beach Area Subsurface Soil

95% Gamma Approximate UCL (use when n>=50)	0.449	95% Gamma Adjusted UCL (use when n<50)	0.464

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.272	SD (KM)	0.715
Variance (KM)	0.511	SE of Mean (KM)	0.14
k hat (KM)	0.145	k star (KM)	0.153
nu hat (KM)	7.803	nu star (KM)	8.27
theta hat (KM)	1.88	theta star (KM)	1.774
80% gamma percentile (KM)	0.301	90% gamma percentile (KM)	0.808
95% gamma percentile (KM)	1.489	99% gamma percentile (KM)	3.457

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.27, α)	2.892	Adjusted Chi Square Value (8.27, β)	2.692
95% Gamma Approximate KM-UCL (use when n>=50)	0.777	95% Gamma Adjusted KM-UCL (use when n<50)	0.834

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.903	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.92	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.145	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.17	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.271	Mean in Log Scale	-2.413
SD in Original Scale	0.728	SD in Log Scale	1.221
95% t UCL (assumes normality of ROS data)	0.51	95% Percentile Bootstrap UCL	0.526
95% BCA Bootstrap UCL	0.706	95% Bootstrap t UCL	1.716
95% H-UCL (Log ROS)	0.371		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.406	KM Geo Mean	0.0902
KM SD (logged)	1.191	95% Critical H Value (KM-Log)	2.78
KM Standard Error of Mean (logged)	0.234	95% H-UCL (KM -Log)	0.351
KM SD (logged)	1.191	95% Critical H Value (KM-Log)	2.78
KM Standard Error of Mean (logged)	0.234		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.271	Mean in Log Scale	-2.418
SD in Original Scale	0.728	SD in Log Scale	1.228
95% t UCL (Assumes normality)	0.51	95% H-Stat UCL	0.374

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.351

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Subsurface Soil

RA_SO_Metals|Cadmium|mg/kg

General Statistics

Total Number of Observations	37	Number of Distinct Observations	31
		Number of Missing Observations	12
Number of Detects	32	Number of Non-Detects	5
Number of Distinct Detects	29	Number of Distinct Non-Detects	2
Minimum Detect	0.02	Minimum Non-Detect	0.015
Maximum Detect	9.06	Maximum Non-Detect	0.5
Variance Detects	3.22	Percent Non-Detects	13.51%
Mean Detects	1.022	SD Detects	1.795
Median Detects	0.243	CV Detects	1.756
Skewness Detects	3.299	Kurtosis Detects	12.98
Mean of Logged Detects	-1.063	SD of Logged Detects	1.518

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.583	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.321	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.154	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.9	KM Standard Error of Mean	0.279
KM SD	1.672	95% KM (BCA) UCL	1.414
95% KM (t) UCL	1.372	95% KM (Percentile Bootstrap) UCL	1.39
95% KM (z) UCL	1.36	95% KM Bootstrap t UCL	1.817
90% KM Chebyshev UCL	1.738	95% KM Chebyshev UCL	2.118
97.5% KM Chebyshev UCL	2.644	99% KM Chebyshev UCL	3.679

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.242	Anderson-Darling GOF Test	
5% A-D Critical Value	0.804	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.182	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.164	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.574	k star (bias corrected MLE)	0.541
Theta hat (MLE)	1.782	Theta star (bias corrected MLE)	1.89
nu hat (MLE)	36.7	nu star (bias corrected)	34.6
Mean (detects)	1.022		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.893
Maximum	9.06	Median	0.226
SD	1.698	CV	1.901
k hat (MLE)	0.479	k star (bias corrected MLE)	0.458
Theta hat (MLE)	1.866	Theta star (bias corrected MLE)	1.951
nu hat (MLE)	35.42	nu star (bias corrected)	33.88
Adjusted Level of Significance (β)	0.0431		
Approximate Chi Square Value (33.88, α)	21.57	Adjusted Chi Square Value (33.88, β)	21.14
95% Gamma Approximate UCL (use when n>=50)	1.403	95% Gamma Adjusted UCL (use when n<50)	1.431

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.9	SD (KM)	1.672
Variance (KM)	2.794	SE of Mean (KM)	0.279
k hat (KM)	0.29	k star (KM)	0.284
nu hat (KM)	21.46	nu star (KM)	21.05
theta hat (KM)	3.104	theta star (KM)	3.164
80% gamma percentile (KM)	1.361	90% gamma percentile (KM)	2.671

On-Project Blue Beach Area Subsurface Soil

95% gamma percentile (KM)	4.188	99% gamma percentile (KM)	8.157

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (21.05, α)	11.63	Adjusted Chi Square Value (21.05, β)	11.32
95% Gamma Approximate KM-UCL (use when n>=50)	1.629	95% Gamma Adjusted KM-UCL (use when n<50)	1.673

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.97	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.93	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.111	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.154	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.9	Mean in Log Scale	-1.281
SD in Original Scale	1.695	SD in Log Scale	1.589
95% t UCL (assumes normality of ROS data)	1.371	95% Percentile Bootstrap UCL	1.388
95% BCA Bootstrap UCL	1.605	95% Bootstrap t UCL	1.854
95% H-UCL (Log ROS)	2.254		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.273	KM Geo Mean	0.28
KM SD (logged)	1.542	95% Critical H Value (KM-Log)	3.076
KM Standard Error of Mean (logged)	0.263	95% H-UCL (KM -Log)	2.028
KM SD (logged)	1.542	95% Critical H Value (KM-Log)	3.076
KM Standard Error of Mean (logged)	0.263		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.911	Mean in Log Scale	-1.201
SD in Original Scale	1.69	SD in Log Scale	1.544
95% t UCL (Assumes normality)	1.38	95% H-Stat UCL	2.185

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	2.118

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Subsurface Soil

RA_SO_VOCs_VPHs|1,2,4-Trimethylbenzene|mg/kg

General Statistics			
Total Number of Observations	37	Number of Distinct Observations	24
		Number of Missing Observations	11
Number of Detects	7	Number of Non-Detects	30
Number of Distinct Detects	7	Number of Distinct Non-Detects	17
Minimum Detect	0.0015	Minimum Non-Detect	0.001
Maximum Detect	63.3	Maximum Non-Detect	0.21
Variance Detects	534.5	Percent Non-Detects	81.08%
Mean Detects	12.85	SD Detects	23.12
Median Detects	0.0066	CV Detects	1.8
Skewness Detects	2.265	Kurtosis Detects	5.361
Mean of Logged Detects	-1.859	SD of Logged Detects	4.696

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.645	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.334	Lilliefors GOF Test
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Level
Detected Data Not Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	2.431	KM Standard Error of Mean	1.879
KM SD	10.58	95% KM (BCA) UCL	5.804
95% KM (t) UCL	5.604	95% KM (Percentile Bootstrap) UCL	5.518
95% KM (z) UCL	5.522	95% KM Bootstrap t UCL	13.3
90% KM Chebyshev UCL	8.069	95% KM Chebyshev UCL	10.62
97.5% KM Chebyshev UCL	14.17	99% KM Chebyshev UCL	21.13

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.775	Anderson-Darling GOF Test
5% A-D Critical Value	0.848	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.353	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.346	Detected Data Not Gamma Distributed at 5% Significance Level
Detected data follow Appr. Gamma Distribution at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.171	k star (bias corrected MLE)	0.193
Theta hat (MLE)	75.17	Theta star (bias corrected MLE)	66.59
nu hat (MLE)	2.392	nu star (bias corrected)	2.7
Mean (detects)	12.85		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0015	Mean	2.438
Maximum	63.3	Median	0.01
SD	10.73	CV	4.399
k hat (MLE)	0.154	k star (bias corrected MLE)	0.159
Theta hat (MLE)	15.85	Theta star (bias corrected MLE)	15.3
nu hat (MLE)	11.39	nu star (bias corrected)	11.8
Adjusted Level of Significance (β)	0.0431		
Approximate Chi Square Value (11.80, α)	5.093	Adjusted Chi Square Value (11.80, β)	4.902
95% Gamma Approximate UCL (use when n>=50)	5.647	95% Gamma Adjusted UCL (use when n<50)	5.867

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	2.431	SD (KM)	10.58
Variance (KM)	112	SE of Mean (KM)	1.879
k hat (KM)	0.0528	k star (KM)	0.0665
nu hat (KM)	3.906	nu star (KM)	4.922
theta hat (KM)	46.06	theta star (KM)	36.55
80% gamma percentile (KM)	0.771	90% gamma percentile (KM)	5.031

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95% gamma percentile (KM)	13.89	99% gamma percentile (KM)	46.88

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.92, α)	1.116	Adjusted Chi Square Value (4.92, β)	1.041
95% Gamma Approximate KM-UCL (use when n>=50)	10.72	95% Gamma Adjusted KM-UCL (use when n<50)	11.49

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.788	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.321	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.43	Mean in Log Scale	-12.34
SD in Original Scale	10.73	SD in Log Scale	6.273
95% t UCL (assumes normality of ROS data)	5.408	95% Percentile Bootstrap UCL	5.517
95% BCA Bootstrap UCL	8.281	95% Bootstrap t UCL	13.46
95% H-UCL (Log ROS)	94410493		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.835	KM Geo Mean	0.00292
KM SD (logged)	2.704	95% Critical H Value (KM-Log)	4.796
KM Standard Error of Mean (logged)	0.49	95% H-UCL (KM -Log)	0.984
KM SD (logged)	2.704	95% Critical H Value (KM-Log)	4.796
KM Standard Error of Mean (logged)	0.49		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.434	Mean in Log Scale	-5.592
SD in Original Scale	10.73	SD in Log Scale	2.763
95% t UCL (Assumes normality)	5.412	95% H-Stat UCL	1.612

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 11.49

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Subsurface Soil

RA_SO_VOCs_VPHs|Ethylbenzene|mg/kg

General Statistics

Total Number of Observations	38	Number of Distinct Observations	22
		Number of Missing Observations	12
Number of Detects	6	Number of Non-Detects	32
Number of Distinct Detects	5	Number of Distinct Non-Detects	19
Minimum Detect	0.0021	Minimum Non-Detect	0.001
Maximum Detect	77.9	Maximum Non-Detect	0.22
Variance Detects	1000	Percent Non-Detects	84.21%
Mean Detects	13.35	SD Detects	31.63
Median Detects	0.162	CV Detects	2.369
Skewness Detects	2.447	Kurtosis Detects	5.989
Mean of Logged Detects	-2.425	SD of Logged Detects	4.434

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.513	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.475	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.11	KM Standard Error of Mean	2.215
KM SD	12.46	95% KM (BCA) UCL	6.218
95% KM (t) UCL	5.846	95% KM (Percentile Bootstrap) UCL	6.201
95% KM (z) UCL	5.753	95% KM Bootstrap t UCL	487.2
90% KM Chebyshev UCL	8.754	95% KM Chebyshev UCL	11.76
97.5% KM Chebyshev UCL	15.94	99% KM Chebyshev UCL	24.15

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.647	Anderson-Darling GOF Test	
5% A-D Critical Value	0.845	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.286	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.369	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.153	k star (bias corrected MLE)	0.188
Theta hat (MLE)	87.39	Theta star (bias corrected MLE)	71.21
nu hat (MLE)	1.833	nu star (bias corrected)	2.25
Mean (detects)	13.35		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0021	Mean	2.117
Maximum	77.9	Median	0.01
SD	12.63	CV	5.966
k hat (MLE)	0.153	k star (bias corrected MLE)	0.158
Theta hat (MLE)	13.84	Theta star (bias corrected MLE)	13.36
nu hat (MLE)	11.62	nu star (bias corrected)	12.04
Adjusted Level of Significance (β)	0.0434		
Approximate Chi Square Value (12.04, α)	5.253	Adjusted Chi Square Value (12.04, β)	5.068
95% Gamma Approximate UCL (use when n>=50)	4.851	95% Gamma Adjusted UCL (use when n<50)	5.029

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.11	SD (KM)	12.46
Variance (KM)	155.3	SE of Mean (KM)	2.215
k hat (KM)	0.0286	k star (KM)	0.0439
nu hat (KM)	2.177	nu star (KM)	3.339
theta hat (KM)	73.64	theta star (KM)	48.02
80% gamma percentile (KM)	0.174	90% gamma percentile (KM)	2.675

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95% gamma percentile (KM)	10.63	99% gamma percentile (KM)	48.21

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.34, α)	0.479	Adjusted Chi Square Value (3.34, β)	0.44
95% Gamma Approximate KM-UCL (use when n>=50)	14.69	95% Gamma Adjusted KM-UCL (use when n<50)	15.99

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.844	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.295	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.109	Mean in Log Scale	-9.6
SD in Original Scale	12.63	SD in Log Scale	4.318
95% t UCL (assumes normality of ROS data)	5.566	95% Percentile Bootstrap UCL	6.168
95% BCA Bootstrap UCL	10.26	95% Bootstrap t UCL	512.2
95% H-UCL (Log ROS)	144.6		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.95	KM Geo Mean	0.00261
KM SD (logged)	2.243	95% Critical H Value (KM-Log)	4.108
KM Standard Error of Mean (logged)	0.423	95% H-UCL (KM -Log)	0.147
KM SD (logged)	2.243	95% Critical H Value (KM-Log)	4.108
KM Standard Error of Mean (logged)	0.423		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.115	Mean in Log Scale	-5.741
SD in Original Scale	12.63	SD in Log Scale	2.42
95% t UCL (Assumes normality)	5.572	95% H-Stat UCL	0.343

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 15.99

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Subsurface Soil

RA_SO_VOCs_VPHs|Total Xylenes|mg/kg

General Statistics

Total Number of Observations	38	Number of Distinct Observations	23
		Number of Missing Observations	12
Number of Detects	7	Number of Non-Detects	31
Number of Distinct Detects	6	Number of Distinct Non-Detects	19
Minimum Detect	0.0065	Minimum Non-Detect	0.0036
Maximum Detect	490	Maximum Non-Detect	0.66
Variance Detects	34056	Percent Non-Detects	81.58%
Mean Detects	71.57	SD Detects	184.5
Median Detects	0.017	CV Detects	2.579
Skewness Detects	2.644	Kurtosis Detects	6.993
Mean of Logged Detects	-1.197	SD of Logged Detects	4.267

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.466	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.489	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	13.19	KM Standard Error of Mean	13.74
KM SD	78.4	95% KM (BCA) UCL	39.17
95% KM (t) UCL	36.36	95% KM (Percentile Bootstrap) UCL	38.93
95% KM (z) UCL	35.78	95% KM Bootstrap t UCL	3757
90% KM Chebyshev UCL	54.4	95% KM Chebyshev UCL	73.07
97.5% KM Chebyshev UCL	98.98	99% KM Chebyshev UCL	149.9

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.902	Anderson-Darling GOF Test	
5% A-D Critical Value	0.874	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.323	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.349	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.142	k star (bias corrected MLE)	0.176
Theta hat (MLE)	504.9	Theta star (bias corrected MLE)	406.1
nu hat (MLE)	1.984	nu star (bias corrected)	2.467
Mean (detects)	71.57		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0065	Mean	13.19
Maximum	490	Median	0.01
SD	79.45	CV	6.023
k hat (MLE)	0.121	k star (bias corrected MLE)	0.129
Theta hat (MLE)	109.2	Theta star (bias corrected MLE)	102.4
nu hat (MLE)	9.183	nu star (bias corrected)	9.792
Adjusted Level of Significance (β)	0.0434		
Approximate Chi Square Value (9.79, α)	3.812	Adjusted Chi Square Value (9.79, β)	3.658
95% Gamma Approximate UCL (use when n>=50)	33.88	95% Gamma Adjusted UCL (use when n<50)	35.31

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	13.19	SD (KM)	78.4
Variance (KM)	6147	SE of Mean (KM)	13.74
k hat (KM)	0.0283	k star (KM)	0.0436
nu hat (KM)	2.15	nu star (KM)	3.313
theta hat (KM)	466.2	theta star (KM)	302.5
80% gamma percentile (KM)	1.057	90% gamma percentile (KM)	16.53

On-Project Blue Beach Area Subsurface Soil

95% gamma percentile (KM)	66.21	99% gamma percentile (KM)	302.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.31, α)	0.471	Adjusted Chi Square Value (3.31, β)	0.433
95% Gamma Approximate KM-UCL (use when n>=50)	92.76	95% Gamma Adjusted KM-UCL (use when n<50)	101

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.839	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.321	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data Not Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	13.18	Mean in Log Scale	-13.15
SD in Original Scale	79.45	SD in Log Scale	6.744
95% t UCL (assumes normality of ROS data)	34.93	95% Percentile Bootstrap UCL	38.93
95% BCA Bootstrap UCL	64.56	95% Bootstrap t UCL	3803
95% H-UCL (Log ROS)	4.383E+9		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.736	KM Geo Mean	0.00877
KM SD (logged)	2.397	95% Critical H Value (KM-Log)	4.343
KM Standard Error of Mean (logged)	0.427	95% H-UCL (KM -Log)	0.86
KM SD (logged)	2.397	95% Critical H Value (KM-Log)	4.343
KM Standard Error of Mean (logged)	0.427		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	13.2	Mean in Log Scale	-4.501
SD in Original Scale	79.45	SD in Log Scale	2.559
95% t UCL (Assumes normality)	34.95	95% H-Stat UCL	2.021

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 101

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Subsurface Soil

RA_SO_VOCs_VPHs|Trichloroethylene|mg/kg

General Statistics			
Total Number of Observations	37	Number of Distinct Observations	26
		Number of Missing Observations	11
Number of Detects	9	Number of Non-Detects	28
Number of Distinct Detects	9	Number of Distinct Non-Detects	18
Minimum Detect	0.0018	Minimum Non-Detect	0.001
Maximum Detect	2.58	Maximum Non-Detect	0.21
Variance Detects	1.051	Percent Non-Detects	75.68%
Mean Detects	0.609	SD Detects	1.025
Median Detects	0.0091	CV Detects	1.683
Skewness Detects	1.483	Kurtosis Detects	0.609
Mean of Logged Detects	-3.253	SD of Logged Detects	2.883

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.658	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.384	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.149	KM Standard Error of Mean	0.0947
KM SD	0.543	95% KM (BCA) UCL	0.323
95% KM (t) UCL	0.309	95% KM (Percentile Bootstrap) UCL	0.304
95% KM (z) UCL	0.305	95% KM Bootstrap t UCL	0.748
90% KM Chebyshev UCL	0.433	95% KM Chebyshev UCL	0.562
97.5% KM Chebyshev UCL	0.741	99% KM Chebyshev UCL	1.092

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.997	Anderson-Darling GOF Test	
5% A-D Critical Value	0.825	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.339	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.304	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.257	k star (bias corrected MLE)	0.245
Theta hat (MLE)	2.375	Theta star (bias corrected MLE)	2.486
nu hat (MLE)	4.617	nu star (bias corrected)	4.412
Mean (detects)	0.609		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0018	Mean	0.156
Maximum	2.58	Median	0.01
SD	0.549	CV	3.525
k hat (MLE)	0.287	k star (bias corrected MLE)	0.282
Theta hat (MLE)	0.542	Theta star (bias corrected MLE)	0.552
nu hat (MLE)	21.26	nu star (bias corrected)	20.87
Adjusted Level of Significance (β)	0.0431		
Approximate Chi Square Value (20.87, α)	11.5	Adjusted Chi Square Value (20.87, β)	11.19
95% Gamma Approximate UCL (use when n>=50)	0.283	95% Gamma Adjusted UCL (use when n<50)	0.29

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.149	SD (KM)	0.543
Variance (KM)	0.295	SE of Mean (KM)	0.0947
k hat (KM)	0.0754	k star (KM)	0.0873
nu hat (KM)	5.578	nu star (KM)	6.459
theta hat (KM)	1.979	theta star (KM)	1.709
80% gamma percentile (KM)	0.0834	90% gamma percentile (KM)	0.372

On-Project Blue Beach Area Subsurface Soil

95% gamma percentile (KM)	0.869	99% gamma percentile (KM)	2.534

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.46, α)	1.879	Adjusted Chi Square Value (6.46, β)	1.774
95% Gamma Approximate KM-UCL (use when n>=50)	0.513	95% Gamma Adjusted KM-UCL (use when n<50)	0.543

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.829	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.25	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.148	Mean in Log Scale	-9.415
SD in Original Scale	0.551	SD in Log Scale	4.13
95% t UCL (assumes normality of ROS data)	0.301	95% Percentile Bootstrap UCL	0.314
95% BCA Bootstrap UCL	0.392	95% Bootstrap t UCL	0.75
95% H-UCL (Log ROS)	53.13		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.866	KM Geo Mean	0.00283
KM SD (logged)	2.017	95% Critical H Value (KM-Log)	3.755
KM Standard Error of Mean (logged)	0.374	95% H-UCL (KM -Log)	0.0766
KM SD (logged)	2.017	95% Critical H Value (KM-Log)	3.755
KM Standard Error of Mean (logged)	0.374		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.152	Mean in Log Scale	-5.689
SD in Original Scale	0.55	SD in Log Scale	2.102
95% t UCL (Assumes normality)	0.305	95% H-Stat UCL	0.12

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	0.741

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL Input/Output
Off-Project Red Maple Swamp / Tidal Stream Area Subsurface Soil

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_Metals|Arsenic|mg/kg	D_RA_SO_Metals|Arsenic|mg/kg
SO	T	SO-OffProject_RedMapleSwamp	B-12-110502 (S-2)	11/5/2002	2 - 4 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-1	11/5/2002	4 - 6 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-2	11/8/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-3	11/5/2002	10 - 12 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-5	11/5/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	0 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	3 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-201	9/18/2013	8 - 10 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	13 - 15 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	8 - 10 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-203	9/18/2013	8 - 10 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-204	9/18/2013	8 - 10 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-205	9/18/2013	7 - 9 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-206	9/18/2013	8 - 10 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-207	9/18/2013	8 - 10 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-208	9/18/2013	8 - 10 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	10 - 12 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	8 - 10 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-210	9/18/2013	8 - 10 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-213	9/18/2013	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-214	9/18/2013	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-216	9/18/2013	8 - 10 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-217	9/18/2013	8 - 10 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-1A	11/30/2011	1 - 2 ft	5.8	1
SO	T	SO-OffProject_RedMapleSwamp	SS-2A	11/30/2011	1 - 2 ft	3.3	1
SO	T	SO-OffProject_RedMapleSwamp	SS-3A	11/30/2011	1 - 2 ft	3.2	1
SO	T	SO-OffProject_RedMapleSwamp	SS-4A	11/30/2011	1 - 2 ft	4	1
SO	T	SO-OffProject_RedMapleSwamp	SS-5A	11/30/2011	1 - 2 ft	2.9	1
SO	T	SO-OffProject_RedMapleSwamp	SS-6A	11/30/2011	1 - 2 ft	7.6	1

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_SVOCs_EPHs|Benzo(a)Pyrene|mg/kg	D_RA_SO_SVOCs_EPHs|Benzo(a)Pyrene|mg/kg
SO	T	SO-OffProject_RedMapleSwamp	B-12-110502 (S-2)	11/5/2002	2 - 4 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-1	11/5/2002	4 - 6 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-2	11/8/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-3	11/5/2002	10 - 12 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-5	11/5/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	0 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	3 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-201	9/18/2013	8 - 10 ft	0.17	0
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	13 - 15 ft	0.16	0
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	8 - 10 ft	0.17	0
SO	T	SO-OffProject_RedMapleSwamp	SB-203	9/18/2013	8 - 10 ft	0.16	0
SO	T	SO-OffProject_RedMapleSwamp	SB-204	9/18/2013	8 - 10 ft	0.18	0
SO	T	SO-OffProject_RedMapleSwamp	SB-205	9/18/2013	7 - 9 ft	0.19	0
SO	T	SO-OffProject_RedMapleSwamp	SB-206	9/18/2013	8 - 10 ft	0.64	1
SO	T	SO-OffProject_RedMapleSwamp	SB-207	9/18/2013	8 - 10 ft	0.86	1
SO	T	SO-OffProject_RedMapleSwamp	SB-208	9/18/2013	8 - 10 ft	0.16	0
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	10 - 12 ft	0.17	0
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	8 - 10 ft	0.17	0
SO	T	SO-OffProject_RedMapleSwamp	SB-210	9/18/2013	8 - 10 ft	0.17	0
SO	T	SO-OffProject_RedMapleSwamp	SB-213	9/18/2013	6 - 8 ft	0.16	0
SO	T	SO-OffProject_RedMapleSwamp	SB-214	9/18/2013	6 - 8 ft	0.17	0
SO	T	SO-OffProject_RedMapleSwamp	SB-216	9/18/2013	8 - 10 ft	0.16	0
SO	T	SO-OffProject_RedMapleSwamp	SB-217	9/18/2013	8 - 10 ft	0.18	0
SO	T	SO-OffProject_RedMapleSwamp	SS-1A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-2A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-3A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-4A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-5A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-6A	11/30/2011	1 - 2 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_SVOCs_EPHs|C11-C22 AROMATICS (ADJUSTED)|mg/kg	D_RA_SO_SVOCs_EPHs|C11-C22 AROMATICS (ADJUSTED)|mg/kg
SO	T	SO-OffProject_RedMapleSwamp	B-12-110502 (S-2)	11/5/2002	2 - 4 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-1	11/5/2002	4 - 6 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-2	11/8/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-3	11/5/2002	10 - 12 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-5	11/5/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	0 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	3 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-201	9/18/2013	8 - 10 ft	214	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	13 - 15 ft	11.5	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	8 - 10 ft	175	1
SO	T	SO-OffProject_RedMapleSwamp	SB-203	9/18/2013	8 - 10 ft	166	1
SO	T	SO-OffProject_RedMapleSwamp	SB-204	9/18/2013	8 - 10 ft	67.1	1
SO	T	SO-OffProject_RedMapleSwamp	SB-205	9/18/2013	7 - 9 ft	50.7	1
SO	T	SO-OffProject_RedMapleSwamp	SB-206	9/18/2013	8 - 10 ft	119	1
SO	T	SO-OffProject_RedMapleSwamp	SB-207	9/18/2013	8 - 10 ft	46.3	1
SO	T	SO-OffProject_RedMapleSwamp	SB-208	9/18/2013	8 - 10 ft	56.8	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	10 - 12 ft	95.6	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	8 - 10 ft	196	1
SO	T	SO-OffProject_RedMapleSwamp	SB-210	9/18/2013	8 - 10 ft	351	1
SO	T	SO-OffProject_RedMapleSwamp	SB-213	9/18/2013	6 - 8 ft	249	1
SO	T	SO-OffProject_RedMapleSwamp	SB-214	9/18/2013	6 - 8 ft	264	1
SO	T	SO-OffProject_RedMapleSwamp	SB-216	9/18/2013	8 - 10 ft	120	1
SO	T	SO-OffProject_RedMapleSwamp	SB-217	9/18/2013	8 - 10 ft	31.3	1
SO	T	SO-OffProject_RedMapleSwamp	SS-1A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-2A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-3A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-4A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-5A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-6A	11/30/2011	1 - 2 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_SVOCs_EPHs|C9-C18 ALIPHATICS|mg/kg	D_RA_SO_SVOCs_EPHs|C9-C18 ALIPHATICS|mg/kg
SO	T	SO-OffProject_RedMapleSwamp	B-12-110502 (S-2)	11/5/2002	2 - 4 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-1	11/5/2002	4 - 6 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-2	11/8/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-3	11/5/2002	10 - 12 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-5	11/5/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	0 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	3 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-201	9/18/2013	8 - 10 ft	1450	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	13 - 15 ft	51.3	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	8 - 10 ft	2270	1
SO	T	SO-OffProject_RedMapleSwamp	SB-203	9/18/2013	8 - 10 ft	965	1
SO	T	SO-OffProject_RedMapleSwamp	SB-204	9/18/2013	8 - 10 ft	318	1
SO	T	SO-OffProject_RedMapleSwamp	SB-205	9/18/2013	7 - 9 ft	306	1
SO	T	SO-OffProject_RedMapleSwamp	SB-206	9/18/2013	8 - 10 ft	123	1
SO	T	SO-OffProject_RedMapleSwamp	SB-207	9/18/2013	8 - 10 ft	16.3	1
SO	T	SO-OffProject_RedMapleSwamp	SB-208	9/18/2013	8 - 10 ft	79.5	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	10 - 12 ft	554	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	8 - 10 ft	898	1
SO	T	SO-OffProject_RedMapleSwamp	SB-210	9/18/2013	8 - 10 ft	1260	1
SO	T	SO-OffProject_RedMapleSwamp	SB-213	9/18/2013	6 - 8 ft	193	1
SO	T	SO-OffProject_RedMapleSwamp	SB-214	9/18/2013	6 - 8 ft	1380	1
SO	T	SO-OffProject_RedMapleSwamp	SB-216	9/18/2013	8 - 10 ft	560	1
SO	T	SO-OffProject_RedMapleSwamp	SB-217	9/18/2013	8 - 10 ft	285	1
SO	T	SO-OffProject_RedMapleSwamp	SS-1A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-2A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-3A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-4A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-5A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-6A	11/30/2011	1 - 2 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_SVOCs_EPHs|Naphthalene|mg/kg	D_RA_SO_SVOCs_EPHs|Naphthalene|mg/kg
SO	T	SO-OffProject_RedMapleSwamp	B-12-110502 (S-2)	11/5/2002	2 - 4 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-1	11/5/2002	4 - 6 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-2	11/8/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-3	11/5/2002	10 - 12 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-5	11/5/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	0 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	3 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-201	9/18/2013	8 - 10 ft	0.28	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	13 - 15 ft	0.16	0
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	8 - 10 ft	0.13	1
SO	T	SO-OffProject_RedMapleSwamp	SB-203	9/18/2013	8 - 10 ft	0.24	1
SO	T	SO-OffProject_RedMapleSwamp	SB-204	9/18/2013	8 - 10 ft	0.7	1
SO	T	SO-OffProject_RedMapleSwamp	SB-205	9/18/2013	7 - 9 ft	1.65	1
SO	T	SO-OffProject_RedMapleSwamp	SB-206	9/18/2013	8 - 10 ft	0.28	1
SO	T	SO-OffProject_RedMapleSwamp	SB-207	9/18/2013	8 - 10 ft	14.8	1
SO	T	SO-OffProject_RedMapleSwamp	SB-208	9/18/2013	8 - 10 ft	0.74	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	10 - 12 ft	0.76	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	8 - 10 ft	2.7	1
SO	T	SO-OffProject_RedMapleSwamp	SB-210	9/18/2013	8 - 10 ft	4.68	1
SO	T	SO-OffProject_RedMapleSwamp	SB-213	9/18/2013	6 - 8 ft	0.16	0
SO	T	SO-OffProject_RedMapleSwamp	SB-214	9/18/2013	6 - 8 ft	0.61	1
SO	T	SO-OffProject_RedMapleSwamp	SB-216	9/18/2013	8 - 10 ft	0.25	1
SO	T	SO-OffProject_RedMapleSwamp	SB-217	9/18/2013	8 - 10 ft	0.18	0
SO	T	SO-OffProject_RedMapleSwamp	SS-1A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-2A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-3A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-4A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-5A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-6A	11/30/2011	1 - 2 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_VOCs_VPHs|C5-C8 ALIPHATICS (ADJUSTED)|mg/kg	D_RA_SO_VOCs_VPHs|C5-C8 ALIPHATICS (ADJUSTED)|mg/kg
SO	T	SO-OffProject_RedMapleSwamp	B-12-110502 (S-2)	11/5/2002	2 - 4 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-1	11/5/2002	4 - 6 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-2	11/8/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-3	11/5/2002	10 - 12 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-5	11/5/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	0 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	3 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-201	9/18/2013	8 - 10 ft	153	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	13 - 15 ft	6.78	0
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	8 - 10 ft	14	1
SO	T	SO-OffProject_RedMapleSwamp	SB-203	9/18/2013	8 - 10 ft	31.2	1
SO	T	SO-OffProject_RedMapleSwamp	SB-204	9/18/2013	8 - 10 ft	41	1
SO	T	SO-OffProject_RedMapleSwamp	SB-205	9/18/2013	7 - 9 ft	15.2	1
SO	T	SO-OffProject_RedMapleSwamp	SB-206	9/18/2013	8 - 10 ft	98.1	1
SO	T	SO-OffProject_RedMapleSwamp	SB-207	9/18/2013	8 - 10 ft	70.2	0
SO	T	SO-OffProject_RedMapleSwamp	SB-208	9/18/2013	8 - 10 ft	31.6	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	10 - 12 ft	53.3	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	8 - 10 ft	144	1
SO	T	SO-OffProject_RedMapleSwamp	SB-210	9/18/2013	8 - 10 ft	85.4	1
SO	T	SO-OffProject_RedMapleSwamp	SB-213	9/18/2013	6 - 8 ft	6.5	0
SO	T	SO-OffProject_RedMapleSwamp	SB-214	9/18/2013	6 - 8 ft	27.1	1
SO	T	SO-OffProject_RedMapleSwamp	SB-216	9/18/2013	8 - 10 ft	68.2	1
SO	T	SO-OffProject_RedMapleSwamp	SB-217	9/18/2013	8 - 10 ft	26.2	1
SO	T	SO-OffProject_RedMapleSwamp	SS-1A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-2A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-3A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-4A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-5A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-6A	11/30/2011	1 - 2 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_VOCs_VPHs|C9-C10 AROMATICS|mg/kg	D_RA_SO_VOCs_VPHs|C9-C10 AROMATICS|mg/kg
SO	T	SO-OffProject_RedMapleSwamp	B-12-110502 (S-2)	11/5/2002	2 - 4 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-1	11/5/2002	4 - 6 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-2	11/8/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-3	11/5/2002	10 - 12 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-5	11/5/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	0 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	3 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-201	9/18/2013	8 - 10 ft	128	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	13 - 15 ft	32.2	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	8 - 10 ft	94.4	1
SO	T	SO-OffProject_RedMapleSwamp	SB-203	9/18/2013	8 - 10 ft	154	1
SO	T	SO-OffProject_RedMapleSwamp	SB-204	9/18/2013	8 - 10 ft	96.9	1
SO	T	SO-OffProject_RedMapleSwamp	SB-205	9/18/2013	7 - 9 ft	60	1
SO	T	SO-OffProject_RedMapleSwamp	SB-206	9/18/2013	8 - 10 ft	46.3	1
SO	T	SO-OffProject_RedMapleSwamp	SB-207	9/18/2013	8 - 10 ft	23.9	1
SO	T	SO-OffProject_RedMapleSwamp	SB-208	9/18/2013	8 - 10 ft	11.2	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	10 - 12 ft	79.5	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	8 - 10 ft	198	1
SO	T	SO-OffProject_RedMapleSwamp	SB-210	9/18/2013	8 - 10 ft	142	1
SO	T	SO-OffProject_RedMapleSwamp	SB-213	9/18/2013	6 - 8 ft	3.93	1
SO	T	SO-OffProject_RedMapleSwamp	SB-214	9/18/2013	6 - 8 ft	128	1
SO	T	SO-OffProject_RedMapleSwamp	SB-216	9/18/2013	8 - 10 ft	200	1
SO	T	SO-OffProject_RedMapleSwamp	SB-217	9/18/2013	8 - 10 ft	58.1	1
SO	T	SO-OffProject_RedMapleSwamp	SS-1A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-2A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-3A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-4A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-5A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-6A	11/30/2011	1 - 2 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_VOCs_VPHs|C9-C12 ALIPHATICS (ADJUSTED)|mg/kg	D_RA_SO_VOCs_VPHs|C9-C12 ALIPHATICS (ADJUSTED)|mg/kg
SO	T	SO-OffProject_RedMapleSwamp	B-12-110502 (S-2)	11/5/2002	2 - 4 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-1	11/5/2002	4 - 6 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-2	11/8/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-3	11/5/2002	10 - 12 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-5	11/5/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	0 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	3 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-201	9/18/2013	8 - 10 ft	259	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	13 - 15 ft	82.2	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	8 - 10 ft	217	1
SO	T	SO-OffProject_RedMapleSwamp	SB-203	9/18/2013	8 - 10 ft	316	1
SO	T	SO-OffProject_RedMapleSwamp	SB-204	9/18/2013	8 - 10 ft	195	1
SO	T	SO-OffProject_RedMapleSwamp	SB-205	9/18/2013	7 - 9 ft	119	1
SO	T	SO-OffProject_RedMapleSwamp	SB-206	9/18/2013	8 - 10 ft	86	1
SO	T	SO-OffProject_RedMapleSwamp	SB-207	9/18/2013	8 - 10 ft	70.2	0
SO	T	SO-OffProject_RedMapleSwamp	SB-208	9/18/2013	8 - 10 ft	19.4	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	10 - 12 ft	175	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	8 - 10 ft	455	1
SO	T	SO-OffProject_RedMapleSwamp	SB-210	9/18/2013	8 - 10 ft	293	1
SO	T	SO-OffProject_RedMapleSwamp	SB-213	9/18/2013	6 - 8 ft	9.05	1
SO	T	SO-OffProject_RedMapleSwamp	SB-214	9/18/2013	6 - 8 ft	277	1
SO	T	SO-OffProject_RedMapleSwamp	SB-216	9/18/2013	8 - 10 ft	414	1
SO	T	SO-OffProject_RedMapleSwamp	SB-217	9/18/2013	8 - 10 ft	126	1
SO	T	SO-OffProject_RedMapleSwamp	SS-1A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-2A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-3A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-4A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-5A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-6A	11/30/2011	1 - 2 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_VOCs_VPHs|Ethylbenzene|mg/kg	D_RA_SO_VOCs_VPHs|Ethylbenzene|mg/kg
SO	T	SO-OffProject_RedMapleSwamp	B-12-110502 (S-2)	11/5/2002	2 - 4 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-1	11/5/2002	4 - 6 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-2	11/8/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-3	11/5/2002	10 - 12 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-5	11/5/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	0 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	3 - 5 ft	0.0033	0
SO	T	SO-OffProject_RedMapleSwamp	SB-201	9/18/2013	8 - 10 ft	4.09	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	13 - 15 ft	0.32	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	8 - 10 ft	1.04	1
SO	T	SO-OffProject_RedMapleSwamp	SB-203	9/18/2013	8 - 10 ft	3.93	1
SO	T	SO-OffProject_RedMapleSwamp	SB-204	9/18/2013	8 - 10 ft	1.07	1
SO	T	SO-OffProject_RedMapleSwamp	SB-205	9/18/2013	7 - 9 ft	1.5	1
SO	T	SO-OffProject_RedMapleSwamp	SB-206	9/18/2013	8 - 10 ft	1.77	1
SO	T	SO-OffProject_RedMapleSwamp	SB-207	9/18/2013	8 - 10 ft	0.15	1
SO	T	SO-OffProject_RedMapleSwamp	SB-208	9/18/2013	8 - 10 ft	0.29	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	10 - 12 ft	3.5	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	8 - 10 ft	9.7	1
SO	T	SO-OffProject_RedMapleSwamp	SB-210	9/18/2013	8 - 10 ft	4.21	1
SO	T	SO-OffProject_RedMapleSwamp	SB-213	9/18/2013	6 - 8 ft	0.08	1
SO	T	SO-OffProject_RedMapleSwamp	SB-214	9/18/2013	6 - 8 ft	4.22	1
SO	T	SO-OffProject_RedMapleSwamp	SB-216	9/18/2013	8 - 10 ft	1.97	1
SO	T	SO-OffProject_RedMapleSwamp	SB-217	9/18/2013	8 - 10 ft	0.99	1
SO	T	SO-OffProject_RedMapleSwamp	SS-1A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-2A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-3A	11/30/2011	1 - 2 ft	0.0048	0
SO	T	SO-OffProject_RedMapleSwamp	SS-4A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-5A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-6A	11/30/2011	1 - 2 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SO_VOCs_VPHs|Naphthalene|mg/kg	D_RA_SO_VOCs_VPHs|Naphthalene|mg/kg
SO	T	SO-OffProject_RedMapleSwamp	B-12-110502 (S-2)	11/5/2002	2 - 4 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-1	11/5/2002	4 - 6 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-2	11/8/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-3	11/5/2002	10 - 12 ft		
SO	T	SO-OffProject_RedMapleSwamp	CDW-5	11/5/2002	6 - 8 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	0 - 5 ft		
SO	T	SO-OffProject_RedMapleSwamp	SB-106	11/21/2011	3 - 5 ft	3.3	0
SO	T	SO-OffProject_RedMapleSwamp	SB-201	9/18/2013	8 - 10 ft	3.52	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	13 - 15 ft	0.79	1
SO	T	SO-OffProject_RedMapleSwamp	SB-202	9/18/2013	8 - 10 ft	2.53	1
SO	T	SO-OffProject_RedMapleSwamp	SB-203	9/18/2013	8 - 10 ft	3.19	1
SO	T	SO-OffProject_RedMapleSwamp	SB-204	9/18/2013	8 - 10 ft	6.2	1
SO	T	SO-OffProject_RedMapleSwamp	SB-205	9/18/2013	7 - 9 ft	6.86	1
SO	T	SO-OffProject_RedMapleSwamp	SB-206	9/18/2013	8 - 10 ft	1.19	1
SO	T	SO-OffProject_RedMapleSwamp	SB-207	9/18/2013	8 - 10 ft	19.8	1
SO	T	SO-OffProject_RedMapleSwamp	SB-208	9/18/2013	8 - 10 ft	1.04	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	10 - 12 ft	3.17	1
SO	T	SO-OffProject_RedMapleSwamp	SB-209	9/18/2013	8 - 10 ft	13.4	1
SO	T	SO-OffProject_RedMapleSwamp	SB-210	9/18/2013	8 - 10 ft	13.6	1
SO	T	SO-OffProject_RedMapleSwamp	SB-213	9/18/2013	6 - 8 ft	0.14	1
SO	T	SO-OffProject_RedMapleSwamp	SB-214	9/18/2013	6 - 8 ft	4.1	1
SO	T	SO-OffProject_RedMapleSwamp	SB-216	9/18/2013	8 - 10 ft	6.78	1
SO	T	SO-OffProject_RedMapleSwamp	SB-217	9/18/2013	8 - 10 ft	1.53	1
SO	T	SO-OffProject_RedMapleSwamp	SS-1A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-2A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-3A	11/30/2011	1 - 2 ft	4.8	0
SO	T	SO-OffProject_RedMapleSwamp	SS-4A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-5A	11/30/2011	1 - 2 ft		
SO	T	SO-OffProject_RedMapleSwamp	SS-6A	11/30/2011	1 - 2 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.110/2/2020 8:46:44 AM
From File	Input_SubsurfSoil_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_SO_Metals|Arsenic|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	23
Minimum	2.9	Mean	4.467
Maximum	7.6	Median	3.65
SD	1.857	Std. Error of Mean	0.758
Coefficient of Variation	0.416	Skewness	1.199

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.844	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.266	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	5.994	95% Adjusted-CLT UCL (Chen-1995)	6.11
		95% Modified-t UCL (Johnson-1978)	6.056

Gamma GOF Test

A-D Test Statistic	0.468	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.255	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.333	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.94	k star (bias corrected MLE)	4.081
Theta hat (MLE)	0.563	Theta star (bias corrected MLE)	1.095
nu hat (MLE)	95.28	nu star (bias corrected)	48.97
MLE Mean (bias corrected)	4.467	MLE Sd (bias corrected)	2.211
		Approximate Chi Square Value (0.05)	33.91
Adjusted Level of Significance	0.0122	Adjusted Chi Square Value	29.45

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	6.451	95% Adjusted Gamma UCL (use when n<50)	7.428

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.887	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.234	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.065	Mean of logged Data	1.432
Maximum of Logged Data	2.028	SD of logged Data	0.381

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Assuming Lognormal Distribution

95% H-UCL	6.758	90% Chebyshev (MVUE) UCL	6.525
95% Chebyshev (MVUE) UCL	7.466	97.5% Chebyshev (MVUE) UCL	8.772
99% Chebyshev (MVUE) UCL	11.34		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	5.713	95% Jackknife UCL	5.994
95% Standard Bootstrap UCL	5.624	95% Bootstrap-t UCL	8.674
95% Hall's Bootstrap UCL	13.26	95% Percentile Bootstrap UCL	5.683
95% BCA Bootstrap UCL	5.917		
90% Chebyshev(Mean, Sd) UCL	6.74	95% Chebyshev(Mean, Sd) UCL	7.77
97.5% Chebyshev(Mean, Sd) UCL	9.2	99% Chebyshev(Mean, Sd) UCL	12.01

Suggested UCL to Use

95% Student's-t UCL	5.994

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

RA_SO_SVOCs_EPHs|Benzo(a)Pyrene|mg/kg

General Statistics

Total Number of Observations	16	Number of Distinct Observations	6
		Number of Missing Observations	7
Number of Detects	2	Number of Non-Detects	14
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	0.64	Minimum Non-Detect	0.16
Maximum Detect	0.86	Maximum Non-Detect	0.19
Variance Detects	0.0242	Percent Non-Detects	87.5%
Mean Detects	0.75	SD Detects	0.156
Median Detects	0.75	CV Detects	0.207
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.299	SD of Logged Detects	0.209

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.234	KM Standard Error of Mean	0.0703
KM SD	0.199	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.357	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.349	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.445	95% KM Chebyshev UCL	0.54
97.5% KM Chebyshev UCL	0.673	99% KM Chebyshev UCL	0.934

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	46.15	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0163	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	184.6	nu star (bias corrected)	N/A
Mean (detects)	0.75		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.234	SD (KM)	0.199
Variance (KM)	0.0396	SE of Mean (KM)	0.0703
k hat (KM)	1.38	k star (KM)	1.163
nu hat (KM)	44.17	nu star (KM)	37.22
theta hat (KM)	0.169	theta star (KM)	0.201
80% gamma percentile (KM)	0.371	90% gamma percentile (KM)	0.519
95% gamma percentile (KM)	0.664	99% gamma percentile (KM)	0.999

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0335
Approximate Chi Square Value (37.22, α)	24.25	Adjusted Chi Square Value (37.22, β)	23.06
95% Gamma Approximate KM-UCL (use when n>=50)	0.359	95% Gamma Adjusted KM-UCL (use when n<50)	0.377

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.258	Mean in Log Scale	-1.59
SD in Original Scale	0.212	SD in Log Scale	0.676
95% t UCL (assumes normality of ROS data)	0.351	95% Percentile Bootstrap UCL	0.351
95% BCA Bootstrap UCL	0.379	95% Bootstrap t UCL	0.455
95% H-UCL (Log ROS)	0.38		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.641	KM Geo Mean	0.194
KM SD (logged)	0.51	95% Critical H Value (KM-Log)	2.06

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

KM Standard Error of Mean (logged)	0.18	95% H-UCL (KM -Log)	0.29
KM SD (logged)	0.51	95% Critical H Value (KM-Log)	2.06
KM Standard Error of Mean (logged)	0.18		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.168	Mean in Log Scale	-2.199
SD in Original Scale	0.231	SD in Log Scale	0.746
95% t UCL (Assumes normality)	0.269	95% H-Stat UCL	0.23

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.357	KM H-UCL	0.29
95% KM (BCA) UCL	N/A		

Warning: One or more Recommended UCL(s) not available!

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

RA_SO_SVOCs_EPHs|C11-C22 AROMATICS (ADJUSTED)|mg/kg

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	7
Minimum	11.5	Mean	138.3
Maximum	351	Median	119.5
SD	97.43	Std. Error of Mean	24.36
Coefficient of Variation	0.704	Skewness	0.654

Normal GOF Test

Shapiro Wilk Test Statistic	0.942	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.143	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	181	95% Adjusted-CLT UCL (Chen-1995)	182.7
		95% Modified-t UCL (Johnson-1978)	181.7

Gamma GOF Test

A-D Test Statistic	0.209	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.752	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.129	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.218	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.755	k star (bias corrected MLE)	1.467
Theta hat (MLE)	78.83	Theta star (bias corrected MLE)	94.27
nu hat (MLE)	56.15	nu star (bias corrected)	46.96
MLE Mean (bias corrected)	138.3	MLE Sd (bias corrected)	114.2
		Approximate Chi Square Value (0.05)	32.23
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	30.85

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	201.5	95% Adjusted Gamma UCL (use when n<50)	210.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.942	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.887	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.143	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.213	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.442	Mean of logged Data	4.618
Maximum of Logged Data	5.861	SD of logged Data	0.916

Assuming Lognormal Distribution

95% H-UCL	283.4	90% Chebyshev (MVUE) UCL	260
95% Chebyshev (MVUE) UCL	310.3	97.5% Chebyshev (MVUE) UCL	380.1
99% Chebyshev (MVUE) UCL	517.4		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	178.4	95% Jackknife UCL	181
95% Standard Bootstrap UCL	176.4	95% Bootstrap-t UCL	188.1
95% Hall's Bootstrap UCL	184.3	95% Percentile Bootstrap UCL	177.8
95% BCA Bootstrap UCL	179.7		
90% Chebyshev(Mean, Sd) UCL	211.4	95% Chebyshev(Mean, Sd) UCL	244.5
97.5% Chebyshev(Mean, Sd) UCL	290.4	99% Chebyshev(Mean, Sd) UCL	380.7

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Suggested UCL to Use	
95% Student's-t UCL	181

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

RA_SO_SVOCs_EPHs|C9-C18 ALIPHATICS|mg/kg

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	7
Minimum	16.3	Mean	669.3
Maximum	2270	Median	436
SD	646.8	Std. Error of Mean	161.7
Coefficient of Variation	0.966	Skewness	1.137

Normal GOF Test

Shapiro Wilk Test Statistic	0.873	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.206	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	952.8	95% Adjusted-CLT UCL (Chen-1995)	984.4
		95% Modified-t UCL (Johnson-1978)	960.4

Gamma GOF Test

A-D Test Statistic	0.188	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.767	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.114	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.222	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.924	k star (bias corrected MLE)	0.792
Theta hat (MLE)	724.3	Theta star (bias corrected MLE)	844.6
nu hat (MLE)	29.57	nu star (bias corrected)	25.36
MLE Mean (bias corrected)	669.3	MLE Sd (bias corrected)	751.9
		Approximate Chi Square Value (0.05)	14.89
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	13.98

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1140	95% Adjusted Gamma UCL (use when n<50)	1214

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.945	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.887	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.126	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.213	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.791	Mean of logged Data	5.876
Maximum of Logged Data	7.728	SD of logged Data	1.371

Assuming Lognormal Distribution

95% H-UCL	2948	90% Chebyshev (MVUE) UCL	1795
95% Chebyshev (MVUE) UCL	2234	97.5% Chebyshev (MVUE) UCL	2844
99% Chebyshev (MVUE) UCL	4042		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	935.3	95% Jackknife UCL	952.8
95% Standard Bootstrap UCL	929.4	95% Bootstrap-t UCL	1027
95% Hall's Bootstrap UCL	1013	95% Percentile Bootstrap UCL	943.4
95% BCA Bootstrap UCL	980.4		
90% Chebyshev(Mean, Sd) UCL	1154	95% Chebyshev(Mean, Sd) UCL	1374
97.5% Chebyshev(Mean, Sd) UCL	1679	99% Chebyshev(Mean, Sd) UCL	2278

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

Suggested UCL to Use	
95% Student's-t UCL	952.8

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

RA_SO_SVOCs_EPHs|Naphthalene|mg/kg

General Statistics			
Total Number of Observations	16	Number of Distinct Observations	14
		Number of Missing Observations	7
Number of Detects	13	Number of Non-Detects	3
Number of Distinct Detects	12	Number of Distinct Non-Detects	2
Minimum Detect	0.13	Minimum Non-Detect	0.16
Maximum Detect	14.8	Maximum Non-Detect	0.18
Variance Detects	16.14	Percent Non-Detects	18.75%
Mean Detects	2.14	SD Detects	4.018
Median Detects	0.7	CV Detects	1.877
Skewness Detects	3.036	Kurtosis Detects	9.732
Mean of Logged Detects	-0.238	SD of Logged Detects	1.355

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.539	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.866	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.327	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.234	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	1.763	KM Standard Error of Mean	0.928
KM SD	3.567	95% KM (BCA) UCL	3.449
95% KM (t) UCL	3.39	95% KM (Percentile Bootstrap) UCL	3.469
95% KM (z) UCL	3.29	95% KM Bootstrap t UCL	8.013
90% KM Chebyshev UCL	4.547	95% KM Chebyshev UCL	5.809
97.5% KM Chebyshev UCL	7.559	99% KM Chebyshev UCL	11

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.991	Anderson-Darling GOF Test	
5% A-D Critical Value	0.781	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.289	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.248	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.616	k star (bias corrected MLE)	0.525
Theta hat (MLE)	3.473	Theta star (bias corrected MLE)	4.074
nu hat (MLE)	16.02	nu star (bias corrected)	13.66
Mean (detects)	2.14		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	1.741
Maximum	14.8	Median	0.445
SD	3.695	CV	2.123
k hat (MLE)	0.407	k star (bias corrected MLE)	0.373
Theta hat (MLE)	4.274	Theta star (bias corrected MLE)	4.672
nu hat (MLE)	13.03	nu star (bias corrected)	11.92
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (11.92, α)	5.176	Adjusted Chi Square Value (11.92, β)	4.679
95% Gamma Approximate UCL (use when n>=50)	4.009	95% Gamma Adjusted UCL (use when n<50)	4.435

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	1.763	SD (KM)	3.567
Variance (KM)	12.72	SE of Mean (KM)	0.928
k hat (KM)	0.244	k star (KM)	0.24
nu hat (KM)	7.819	nu star (KM)	7.687
theta hat (KM)	7.215	theta star (KM)	7.34
80% gamma percentile (KM)	2.523	90% gamma percentile (KM)	5.306

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95% gamma percentile (KM)	8.636	99% gamma percentile (KM)	17.55

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.69, α)	2.555	Adjusted Chi Square Value (7.69, β)	2.23
95% Gamma Approximate KM-UCL (use when n>=50)	5.305	95% Gamma Adjusted KM-UCL (use when n<50)	6.076

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.928	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.866	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.203	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.234	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.751	Mean in Log Scale	-0.709
SD in Original Scale	3.689	SD in Log Scale	1.586
95% t UCL (assumes normality of ROS data)	3.368	95% Percentile Bootstrap UCL	3.471
95% BCA Bootstrap UCL	4.643	95% Bootstrap t UCL	8.029
95% H-UCL (Log ROS)	7.861		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.576	KM Geo Mean	0.562
KM SD (logged)	1.368	95% Critical H Value (KM-Log)	3.311
KM Standard Error of Mean (logged)	0.356	95% H-UCL (KM -Log)	4.619
KM SD (logged)	1.368	95% Critical H Value (KM-Log)	3.311
KM Standard Error of Mean (logged)	0.356		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.754	Mean in Log Scale	-0.66
SD in Original Scale	3.688	SD in Log Scale	1.514
95% t UCL (Assumes normality)	3.371	95% H-Stat UCL	6.561

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	5.809

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

RA_SO_VOCs_VPHs|C5-C8 ALIPHATICS (ADJUSTED)|mg/kg

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	7
Number of Detects	13	Number of Non-Detects	3
Number of Distinct Detects	13	Number of Distinct Non-Detects	3
Minimum Detect	14	Minimum Non-Detect	6.5
Maximum Detect	153	Maximum Non-Detect	70.2
Variance Detects	2188	Percent Non-Detects	18.75%
Mean Detects	60.64	SD Detects	46.77
Median Detects	41	CV Detects	0.771
Skewness Detects	1.062	Kurtosis Detects	0.0103
Mean of Logged Detects	3.828	SD of Logged Detects	0.786

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.855	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.866	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.201	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.234	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	51.9	KM Standard Error of Mean	11.74
KM SD	44.88	95% KM (BCA) UCL	71.06
95% KM (t) UCL	72.49	95% KM (Percentile Bootstrap) UCL	70.75
95% KM (z) UCL	71.22	95% KM Bootstrap t UCL	78.54
90% KM Chebyshev UCL	87.14	95% KM Chebyshev UCL	103.1
97.5% KM Chebyshev UCL	125.2	99% KM Chebyshev UCL	168.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.353	Anderson-Darling GOF Test	
5% A-D Critical Value	0.744	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.178	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.24	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.956	k star (bias corrected MLE)	1.556
Theta hat (MLE)	31	Theta star (bias corrected MLE)	38.97
nu hat (MLE)	50.86	nu star (bias corrected)	40.46
Mean (detects)	60.64		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	50.87
Maximum	153	Median	31.4
SD	47.12	CV	0.926
k hat (MLE)	0.528	k star (bias corrected MLE)	0.471
Theta hat (MLE)	96.27	Theta star (bias corrected MLE)	108
nu hat (MLE)	16.91	nu star (bias corrected)	15.07
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (15.07, α)	7.311	Adjusted Chi Square Value (15.07, β)	6.703
95% Gamma Approximate UCL (use when n>=50)	104.9	95% Gamma Adjusted UCL (use when n<50)	114.4

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	51.9	SD (KM)	44.88
Variance (KM)	2014	SE of Mean (KM)	11.74
k hat (KM)	1.338	k star (KM)	1.129
nu hat (KM)	42.81	nu star (KM)	36.11
theta hat (KM)	38.8	theta star (KM)	45.99
80% gamma percentile (KM)	82.66	90% gamma percentile (KM)	116

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95% gamma percentile (KM)	149	99% gamma percentile (KM)	225.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (36.11, α)	23.36	Adjusted Chi Square Value (36.11, β)	22.2
95% Gamma Approximate KM-UCL (use when n>=50)	80.24	95% Gamma Adjusted KM-UCL (use when n<50)	84.45

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.952	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.866	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.145	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.234	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	51.85	Mean in Log Scale	3.57
SD in Original Scale	46.06	SD in Log Scale	0.93
95% t UCL (assumes normality of ROS data)	72.03	95% Percentile Bootstrap UCL	71
95% BCA Bootstrap UCL	74.56	95% Bootstrap t UCL	79.02
95% H-UCL (Log ROS)	102.1		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.54	KM Geo Mean	34.47
KM SD (logged)	0.961	95% Critical H Value (KM-Log)	2.645
KM Standard Error of Mean (logged)	0.255	95% H-UCL (KM -Log)	105.5
KM SD (logged)	0.961	95% Critical H Value (KM-Log)	2.645
KM Standard Error of Mean (logged)	0.255		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	51.88	Mean in Log Scale	3.483
SD in Original Scale	46.37	SD in Log Scale	1.137
95% t UCL (Assumes normality)	72.2	95% H-Stat UCL	146.5

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	72.49

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

RA_SO_VOCs_VPHs|C9-C10 AROMATICS|mg/kg

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
		Number of Missing Observations	7
Minimum	3.93	Mean	91.03
Maximum	200	Median	86.95
SD	62.59	Std. Error of Mean	15.65
Coefficient of Variation	0.688	Skewness	0.363

Normal GOF Test

Shapiro Wilk Test Statistic	0.948	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.127	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	118.5	95% Adjusted-CLT UCL (Chen-1995)	118.3
		95% Modified-t UCL (Johnson-1978)	118.7

Gamma GOF Test

A-D Test Statistic	0.317	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.755	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.136	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.219	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.483	k star (bias corrected MLE)	1.247
Theta hat (MLE)	61.37	Theta star (bias corrected MLE)	73
nu hat (MLE)	47.47	nu star (bias corrected)	39.9
MLE Mean (bias corrected)	91.03	MLE Sd (bias corrected)	81.52
		Approximate Chi Square Value (0.05)	26.43
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	25.18

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	137.4	95% Adjusted Gamma UCL (use when n<50)	144.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.881	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.887	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.16	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.213	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.369	Mean of logged Data	4.138
Maximum of Logged Data	5.298	SD of logged Data	1.086

Assuming Lognormal Distribution

95% H-UCL	250.4	90% Chebyshev (MVUE) UCL	203.9
95% Chebyshev (MVUE) UCL	247.8	97.5% Chebyshev (MVUE) UCL	308.7
99% Chebyshev (MVUE) UCL	428.3		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	116.8	95% Jackknife UCL	118.5
95% Standard Bootstrap UCL	115.8	95% Bootstrap-t UCL	119
95% Hall's Bootstrap UCL	119.1	95% Percentile Bootstrap UCL	116
95% BCA Bootstrap UCL	118.3		
90% Chebyshev(Mean, Sd) UCL	138	95% Chebyshev(Mean, Sd) UCL	159.2
97.5% Chebyshev(Mean, Sd) UCL	188.7	99% Chebyshev(Mean, Sd) UCL	246.7

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Suggested UCL to Use	
95% Student's-t UCL	118.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

RA_SO_VOCs_VPHs|C9-C12 ALIPHATICS (ADJUSTED)|mg/kg

General Statistics			
Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	7
Number of Detects	15	Number of Non-Detects	1
Number of Distinct Detects	15	Number of Distinct Non-Detects	1
Minimum Detect	9.05	Minimum Non-Detect	70.2
Maximum Detect	455	Maximum Non-Detect	70.2
Variance Detects	17939	Percent Non-Detects	6.25%
Mean Detects	202.8	SD Detects	133.9
Median Detects	195	CV Detects	0.66
Skewness Detects	0.355	Kurtosis Detects	-0.584
Mean of Logged Detects	4.949	SD of Logged Detects	1.1

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.965	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.881	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.117	Lilliefors GOF Test
5% Lilliefors Critical Value	0.22	Detected Data appear Normal at 5% Significance Level
Detected Data appear Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	191.1	KM Standard Error of Mean	34.51
KM SD	133.4	95% KM (BCA) UCL	244.6
95% KM (t) UCL	251.6	95% KM (Percentile Bootstrap) UCL	248.5
95% KM (z) UCL	247.8	95% KM Bootstrap t UCL	256.1
90% KM Chebyshev UCL	294.6	95% KM Chebyshev UCL	341.5
97.5% KM Chebyshev UCL	406.6	99% KM Chebyshev UCL	534.4

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.423	Anderson-Darling GOF Test
5% A-D Critical Value	0.754	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.139	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.225	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.519	k star (bias corrected MLE)	1.26
Theta hat (MLE)	133.5	Theta star (bias corrected MLE)	161
nu hat (MLE)	45.57	nu star (bias corrected)	37.79
Mean (detects)	202.8		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	9.05	Mean	192.8
Maximum	455	Median	185
SD	135.5	CV	0.703
k hat (MLE)	1.43	k star (bias corrected MLE)	1.204
Theta hat (MLE)	134.8	Theta star (bias corrected MLE)	160.1
nu hat (MLE)	45.78	nu star (bias corrected)	38.53
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (38.53, α)	25.31	Adjusted Chi Square Value (38.53, β)	24.09
95% Gamma Approximate UCL (use when n>=50)	293.5	95% Gamma Adjusted UCL (use when n<50)	308.3

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	191.1	SD (KM)	133.4
Variance (KM)	17783	SE of Mean (KM)	34.51
k hat (KM)	2.053	k star (KM)	1.709
nu hat (KM)	65.69	nu star (KM)	54.7
theta hat (KM)	93.08	theta star (KM)	111.8
80% gamma percentile (KM)	291.3	90% gamma percentile (KM)	385.7

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95% gamma percentile (KM)	476.6	99% gamma percentile (KM)	680.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (54.70, α)	38.71	Adjusted Chi Square Value (54.70, β)	37.18
95% Gamma Approximate KM-UCL (use when n>=50)	270	95% Gamma Adjusted KM-UCL (use when n<50)	281.1

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.845	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.179	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.22	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	191.8	Mean in Log Scale	4.844
SD in Original Scale	136.7	SD in Log Scale	1.142
95% t UCL (assumes normality of ROS data)	251.7	95% Percentile Bootstrap UCL	249
95% BCA Bootstrap UCL	252.8	95% Bootstrap t UCL	255.8
95% H-UCL (Log ROS)	577.9		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.801	KM Geo Mean	121.6
KM SD (logged)	1.181	95% Critical H Value (KM-Log)	2.993
KM Standard Error of Mean (logged)	0.307	95% H-UCL (KM -Log)	608.5
KM SD (logged)	1.181	95% Critical H Value (KM-Log)	2.993
KM Standard Error of Mean (logged)	0.307		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	192.4	Mean in Log Scale	4.862
SD in Original Scale	136	SD in Log Scale	1.118
95% t UCL (Assumes normality)	252	95% H-Stat UCL	555.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	251.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

RA_SO_VOCs_VPHs|Ethylbenzene|mg/kg

General Statistics

Total Number of Observations	18	Number of Distinct Observations	18
		Number of Missing Observations	8
Number of Detects	16	Number of Non-Detects	2
Number of Distinct Detects	16	Number of Distinct Non-Detects	2
Minimum Detect	0.08	Minimum Non-Detect	0.0033
Maximum Detect	9.7	Maximum Non-Detect	0.0048
Variance Detects	6.166	Percent Non-Detects	11.11%
Mean Detects	2.427	SD Detects	2.483
Median Detects	1.635	CV Detects	1.023
Skewness Detects	1.753	Kurtosis Detects	4.002
Mean of Logged Detects	0.258	SD of Logged Detects	1.352

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.81	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.198	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.158	KM Standard Error of Mean	0.582
KM SD	2.391	95% KM (BCA) UCL	3.297
95% KM (t) UCL	3.17	95% KM (Percentile Bootstrap) UCL	3.115
95% KM (z) UCL	3.115	95% KM Bootstrap t UCL	3.604
90% KM Chebyshev UCL	3.904	95% KM Chebyshev UCL	4.695
97.5% KM Chebyshev UCL	5.793	99% KM Chebyshev UCL	7.95

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.316	Anderson-Darling GOF Test	
5% A-D Critical Value	0.767	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.138	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.222	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.927	k star (bias corrected MLE)	0.795
Theta hat (MLE)	2.618	Theta star (bias corrected MLE)	3.054
nu hat (MLE)	29.66	nu star (bias corrected)	25.43
Mean (detects)	2.427		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.158
Maximum	9.7	Median	1.285
SD	2.46	CV	1.14
k hat (MLE)	0.589	k star (bias corrected MLE)	0.528
Theta hat (MLE)	3.663	Theta star (bias corrected MLE)	4.088
nu hat (MLE)	21.21	nu star (bias corrected)	19.01
Adjusted Level of Significance (β)	0.0357		
Approximate Chi Square Value (19.01, α)	10.12	Adjusted Chi Square Value (19.01, β)	9.505
95% Gamma Approximate UCL (use when n>=50)	4.053	95% Gamma Adjusted UCL (use when n<50)	4.316

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.158	SD (KM)	2.391
Variance (KM)	5.719	SE of Mean (KM)	0.582
k hat (KM)	0.814	k star (KM)	0.715
nu hat (KM)	29.3	nu star (KM)	25.75
theta hat (KM)	2.651	theta star (KM)	3.016
80% gamma percentile (KM)	3.544	90% gamma percentile (KM)	5.388

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

95% gamma percentile (KM)	7.287	99% gamma percentile (KM)	11.81

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (25.75, α)	15.19	Adjusted Chi Square Value (25.75, β)	14.41
95% Gamma Approximate KM-UCL (use when n>=50)	3.658	95% Gamma Adjusted KM-UCL (use when n<50)	3.855

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.931	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.171	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.164	Mean in Log Scale	-0.0799
SD in Original Scale	2.455	SD in Log Scale	1.607
95% t UCL (assumes normality of ROS data)	3.171	95% Percentile Bootstrap UCL	3.137
95% BCA Bootstrap UCL	3.412	95% Bootstrap t UCL	3.629
95% H-UCL (Log ROS)	13.74		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.405	KM Geo Mean	0.667
KM SD (logged)	2.246	95% Critical H Value (KM-Log)	4.764
KM Standard Error of Mean (logged)	0.547	95% H-UCL (KM -Log)	111.4
KM SD (logged)	2.246	95% Critical H Value (KM-Log)	4.764
KM Standard Error of Mean (logged)	0.547		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.157	Mean in Log Scale	-0.462
SD in Original Scale	2.461	SD in Log Scale	2.451
95% t UCL (Assumes normality)	3.166	95% H-Stat UCL	270

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	3.17

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

RA_SO_VOCs_VPHs|Naphthalene|mg/kg

General Statistics			
Total Number of Observations	18	Number of Distinct Observations	18
		Number of Missing Observations	8
Number of Detects	16	Number of Non-Detects	2
Number of Distinct Detects	16	Number of Distinct Non-Detects	2
Minimum Detect	0.14	Minimum Non-Detect	3.3
Maximum Detect	19.8	Maximum Non-Detect	4.8
Variance Detects	31.14	Percent Non-Detects	11.11%
Mean Detects	5.49	SD Detects	5.58
Median Detects	3.355	CV Detects	1.016
Skewness Detects	1.498	Kurtosis Detects	1.698
Mean of Logged Detects	1.138	SD of Logged Detects	1.257

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.819	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.223	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	5.09	KM Standard Error of Mean	1.278
KM SD	5.233	95% KM (BCA) UCL	7.186
95% KM (t) UCL	7.313	95% KM (Percentile Bootstrap) UCL	7.254
95% KM (z) UCL	7.192	95% KM Bootstrap t UCL	8.354
90% KM Chebyshev UCL	8.924	95% KM Chebyshev UCL	10.66
97.5% KM Chebyshev UCL	13.07	99% KM Chebyshev UCL	17.81

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.208	Anderson-Darling GOF Test	
5% A-D Critical Value	0.763	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.101	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.019	k star (bias corrected MLE)	0.87
Theta hat (MLE)	5.388	Theta star (bias corrected MLE)	6.313
nu hat (MLE)	32.61	nu star (bias corrected)	27.83
Mean (detects)	5.49		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.14	Mean	5.036
Maximum	19.8	Median	3.18
SD	5.406	CV	1.073
k hat (MLE)	1.012	k star (bias corrected MLE)	0.88
Theta hat (MLE)	4.976	Theta star (bias corrected MLE)	5.721
nu hat (MLE)	36.43	nu star (bias corrected)	31.69
Adjusted Level of Significance (β)	0.0357		
Approximate Chi Square Value (31.69, α)	19.83	Adjusted Chi Square Value (31.69, β)	18.93
95% Gamma Approximate UCL (use when n>=50)	8.05	95% Gamma Adjusted UCL (use when n<50)	8.432

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	5.09	SD (KM)	5.233
Variance (KM)	27.39	SE of Mean (KM)	1.278
k hat (KM)	0.946	k star (KM)	0.825
nu hat (KM)	34.06	nu star (KM)	29.71
theta hat (KM)	5.38	theta star (KM)	6.167
80% gamma percentile (KM)	8.303	90% gamma percentile (KM)	12.28

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Soil

95% gamma percentile (KM)	16.33	99% gamma percentile (KM)	25.85
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (29.71, α)	18.27	Adjusted Chi Square Value (29.71, β)	17.41
95% Gamma Approximate KM-UCL (use when n>=50)	8.279	95% Gamma Adjusted KM-UCL (use when n<50)	8.688
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.951	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.13	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	5.038	Mean in Log Scale	1.05
SD in Original Scale	5.404	SD in Log Scale	1.209
95% t UCL (assumes normality of ROS data)	7.254	95% Percentile Bootstrap UCL	7.162
95% BCA Bootstrap UCL	7.691	95% Bootstrap t UCL	8.446
95% H-UCL (Log ROS)	14.11		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	1.046	KM Geo Mean	2.846
KM SD (logged)	1.22	95% Critical H Value (KM-Log)	2.973
KM Standard Error of Mean (logged)	0.309	95% H-UCL (KM -Log)	14.43
KM SD (logged)	1.22	95% Critical H Value (KM-Log)	2.973
KM Standard Error of Mean (logged)	0.309		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	5.105	Mean in Log Scale	1.088
SD in Original Scale	5.362	SD in Log Scale	1.191
95% t UCL (Assumes normality)	7.303	95% H-Stat UCL	14.06
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Level			
Suggested UCL to Use			
Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	8.688		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL Input/Output
Off-Project Red Maple Swamp / Tidal Stream Area Surface Hydric Soil

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_HS_Metals|Arsenic|mg/kg	D_RA_HS_Metals|Arsenic|mg/kg	RA_HS_Metals|Thallium|mg/kg	D_RA_HS_Metals|Thallium|mg/kg
HS	T	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	0 - 1 ft	5.81	1		
HS	T	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	0 - 1 ft	4.4	1		
HS	T	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	0 - 1 ft	3.6	1		
HS	T	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:00 AM	0 - 1 ft	12.9	1	0.242	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:20 AM	0 - 1 ft	5	1	0.13	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:40 AM	0 - 1 ft	13.9	1	0.14	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:00 AM	0 - 1 ft	15.7	1	0.266	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:20 AM	0 - 1 ft	10.2	1	0.14	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:40 AM	0 - 1 ft	5.26	1	0.077	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:00 AM	0 - 1 ft	9.65	1	0.11	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:20 AM	0 - 1 ft	8.67	1	0.095	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:40 AM	0 - 1 ft	16.3	1	0.12	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:00 AM	0 - 1 ft	2.37	1	0.054	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	0 - 1 ft	7.6	1		
HS	T	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	0 - 1 ft	10.5	1		
HS	T	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	0 - 1 ft	6.5	1		

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_HS_Pest_PCBs|Total PCB Aroclors|mg/kg	D_RA_HS_Pest_PCBs|Total PCB Aroclors|mg/kg
HS	T	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	0 - 1 ft	1.1	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	0 - 1 ft	1.4	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	0 - 1 ft	1.5	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:00 AM	0 - 1 ft	0.49	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:20 AM	0 - 1 ft	0.58	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:40 AM	0 - 1 ft	0.46	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:00 AM	0 - 1 ft	0.15	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:20 AM	0 - 1 ft	0.38	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:40 AM	0 - 1 ft	0.14	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:00 AM	0 - 1 ft	0.24	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:20 AM	0 - 1 ft	0.16	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:40 AM	0 - 1 ft	0.25	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:00 AM	0 - 1 ft	0.13	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	0 - 1 ft	2.3	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	0 - 1 ft	2.1	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	0 - 1 ft	1.6	1

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_HS_SVOCs|Benzo(a)Pyrene|mg/kg	D_RA_HS_SVOCs|Benzo(a)Pyrene|mg/kg
HS	T	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:00 AM	0 - 1 ft	1.5	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:20 AM	0 - 1 ft	0.64	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:40 AM	0 - 1 ft	0.3	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:00 AM	0 - 1 ft	3	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:20 AM	0 - 1 ft	0.35	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:40 AM	0 - 1 ft	0.087	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:00 AM	0 - 1 ft	0.22	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:20 AM	0 - 1 ft	0.04	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:40 AM	0 - 1 ft	0.032	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:00 AM	0 - 1 ft	0.096	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	0 - 1 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_HS_SVOCs|Benzo(b)fluoranthene|mg/kg	D_RA_HS_SVOCs|Benzo(b)fluoranthene|mg/kg
HS	T	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:00 AM	0 - 1 ft	1.6	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:20 AM	0 - 1 ft	0.79	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:40 AM	0 - 1 ft	0.52	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:00 AM	0 - 1 ft	4.3	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:20 AM	0 - 1 ft	0.49	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:40 AM	0 - 1 ft	0.16	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:00 AM	0 - 1 ft	0.29	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:20 AM	0 - 1 ft	0.065	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:40 AM	0 - 1 ft	0.065	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:00 AM	0 - 1 ft	0.13	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	0 - 1 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_HS_SVOCs|Dibenzo(a,h)Anthracene|mg/kg	D_RA_HS_SVOCs|Dibenzo(a,h)Anthracene|mg/kg
HS	T	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:00 AM	0 - 1 ft	0.21	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:20 AM	0 - 1 ft	0.08	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:40 AM	0 - 1 ft	0.019	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:00 AM	0 - 1 ft	0.49	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:20 AM	0 - 1 ft	0.066	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:40 AM	0 - 1 ft	0.017	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:00 AM	0 - 1 ft	0.038	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:20 AM	0 - 1 ft	0.028	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:40 AM	0 - 1 ft	0.041	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:00 AM	0 - 1 ft	0.018	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	0 - 1 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_HS_SVOCs|Indeno(1,2,3-CD)Pyrene|mg/kg	D_RA_HS_SVOCs|Indeno(1,2,3-CD)Pyrene|mg/kg
HS	T	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:00 AM	0 - 1 ft	0.66	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:20 AM	0 - 1 ft	0.34	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:40 AM	0 - 1 ft	0.18	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:00 AM	0 - 1 ft	3.3	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:20 AM	0 - 1 ft	0.23	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:40 AM	0 - 1 ft	0.064	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:00 AM	0 - 1 ft	0.14	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:20 AM	0 - 1 ft	0.037	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:40 AM	0 - 1 ft	0.041	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:00 AM	0 - 1 ft	0.071	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	0 - 1 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	0 - 1 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.110/5/2020 9:22:15 AM
From File	Input_HS_Surface.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_HS_Metals|Arsenic|mg/kg

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	2.37	Mean	8.648
Maximum	16.3	Median	8.135
SD	4.338	Std. Error of Mean	1.085
Coefficient of Variation	0.502	Skewness	0.427

Normal GOF Test

Shapiro Wilk Test Statistic	0.948	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.127	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	10.55	95% Adjusted-CLT UCL (Chen-1995)	10.56
		95% Modified-t UCL (Johnson-1978)	10.57

Gamma GOF Test

A-D Test Statistic	0.184	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0942	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.216	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.92	k star (bias corrected MLE)	3.226
Theta hat (MLE)	2.206	Theta star (bias corrected MLE)	2.68
nu hat (MLE)	125.4	nu star (bias corrected)	103.2
MLE Mean (bias corrected)	8.648	MLE Sd (bias corrected)	4.814
		Approximate Chi Square Value (0.05)	80.8
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	78.54

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	11.05	95% Adjusted Gamma UCL (use when n<50)	11.37

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.965	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.887	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.106	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.213	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.863	Mean of logged Data	2.024
Maximum of Logged Data	2.791	SD of logged Data	0.556

Assuming Lognormal Distribution

95% H-UCL	11.97	90% Chebyshev (MVUE) UCL	12.53
95% Chebyshev (MVUE) UCL	14.24	97.5% Chebyshev (MVUE) UCL	16.62
99% Chebyshev (MVUE) UCL	21.3		

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	10.43	95% Jackknife UCL	10.55
95% Standard Bootstrap UCL	10.36	95% Bootstrap-t UCL	10.69
95% Hall's Bootstrap UCL	10.45	95% Percentile Bootstrap UCL	10.41
95% BCA Bootstrap UCL	10.45		
90% Chebyshev(Mean, Sd) UCL	11.9	95% Chebyshev(Mean, Sd) UCL	13.37
97.5% Chebyshev(Mean, Sd) UCL	15.42	99% Chebyshev(Mean, Sd) UCL	19.44

Suggested UCL to Use

95% Student's-t UCL	10.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_HS_Metals|Thallium|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
		Number of Missing Observations	3
Number of Detects	7	Number of Non-Detects	3
Number of Distinct Detects	6	Number of Distinct Non-Detects	3
Minimum Detect	0.077	Minimum Non-Detect	0.054
Maximum Detect	0.266	Maximum Non-Detect	0.12
Variance Detects	0.00484	Percent Non-Detects	30%
Mean Detects	0.158	SD Detects	0.0695
Median Detects	0.14	CV Detects	0.441
Skewness Detects	0.825	Kurtosis Detects	-0.697
Mean of Logged Detects	-1.927	SD of Logged Detects	0.432

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.874	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.316	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.13	KM Standard Error of Mean	0.0238
KM SD	0.0692	95% KM (BCA) UCL	0.172
95% KM (t) UCL	0.174	95% KM (Percentile Bootstrap) UCL	0.168
95% KM (z) UCL	0.169	95% KM Bootstrap t UCL	0.193
90% KM Chebyshev UCL	0.202	95% KM Chebyshev UCL	0.234
97.5% KM Chebyshev UCL	0.279	99% KM Chebyshev UCL	0.367

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.414	Anderson-Darling GOF Test	
5% A-D Critical Value	0.709	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.279	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.313	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	6.364	k star (bias corrected MLE)	3.732
Theta hat (MLE)	0.0248	Theta star (bias corrected MLE)	0.0423
nu hat (MLE)	89.1	nu star (bias corrected)	52.25
Mean (detects)	0.158		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0171	Mean	0.123
Maximum	0.266	Median	0.12
SD	0.0809	CV	0.66
k hat (MLE)	2.15	k star (bias corrected MLE)	1.571
Theta hat (MLE)	0.057	Theta star (bias corrected MLE)	0.078
nu hat (MLE)	42.99	nu star (bias corrected)	31.43
Adjusted Level of Significance (β)	0.0267		
Approximate Chi Square Value (31.43, α)	19.62	Adjusted Chi Square Value (31.43, β)	18.01
95% Gamma Approximate UCL (use when n>=50)	0.196	95% Gamma Adjusted UCL (use when n<50)	0.214

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.13	SD (KM)	0.0692
Variance (KM)	0.00478	SE of Mean (KM)	0.0238
k hat (KM)	3.539	k star (KM)	2.544
nu hat (KM)	70.78	nu star (KM)	50.88
theta hat (KM)	0.0368	theta star (KM)	0.0511
80% gamma percentile (KM)	0.189	90% gamma percentile (KM)	0.239

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

95% gamma percentile (KM)	0.287	99% gamma percentile (KM)	0.39

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (50.88, α)	35.5	Adjusted Chi Square Value (50.88, β)	33.28
95% Gamma Approximate KM-UCL (use when n>=50)	0.186	95% Gamma Adjusted KM-UCL (use when n<50)	0.199

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.931	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.251	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.129	Mean in Log Scale	-2.186
SD in Original Scale	0.0734	SD in Log Scale	0.555
95% t UCL (assumes normality of ROS data)	0.172	95% Percentile Bootstrap UCL	0.169
95% BCA Bootstrap UCL	0.173	95% Bootstrap t UCL	0.196
95% H-UCL (Log ROS)	0.201		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.175	KM Geo Mean	0.114
KM SD (logged)	0.522	95% Critical H Value (KM-Log)	2.251
KM Standard Error of Mean (logged)	0.184	95% H-UCL (KM -Log)	0.192
KM SD (logged)	0.522	95% Critical H Value (KM-Log)	2.251
KM Standard Error of Mean (logged)	0.184		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.124	Mean in Log Scale	-2.296
SD in Original Scale	0.0792	SD in Log Scale	0.718
95% t UCL (Assumes normality)	0.17	95% H-Stat UCL	0.241

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.174

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

RA_HS_Pest_PCBs|Total PCB Aroclors|mg/kg

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
Number of Detects	10	Number of Non-Detects	6
Number of Distinct Detects	10	Number of Distinct Non-Detects	6
Minimum Detect	0.13	Minimum Non-Detect	0.14
Maximum Detect	2.3	Maximum Non-Detect	2.1
Variance Detects	0.513	Percent Non-Detects	37.5%
Mean Detects	0.972	SD Detects	0.716
Median Detects	0.84	CV Detects	0.737
Skewness Detects	0.547	Kurtosis Detects	-0.718
Mean of Logged Detects	-0.355	SD of Logged Detects	0.936

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.923	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.208	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.689	KM Standard Error of Mean	0.181
KM SD	0.672	95% KM (BCA) UCL	1.034
95% KM (t) UCL	1.007	95% KM (Percentile Bootstrap) UCL	0.975
95% KM (z) UCL	0.987	95% KM Bootstrap t UCL	1.081
90% KM Chebyshev UCL	1.232	95% KM Chebyshev UCL	1.478
97.5% KM Chebyshev UCL	1.82	99% KM Chebyshev UCL	2.49

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.293	Anderson-Darling GOF Test	
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.175	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.271	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.677	k star (bias corrected MLE)	1.241
Theta hat (MLE)	0.58	Theta star (bias corrected MLE)	0.784
nu hat (MLE)	33.54	nu star (bias corrected)	24.81
Mean (detects)	0.972		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0475	Mean	0.662
Maximum	2.3	Median	0.416
SD	0.698	CV	1.055
k hat (MLE)	0.862	k star (bias corrected MLE)	0.742
Theta hat (MLE)	0.768	Theta star (bias corrected MLE)	0.892
nu hat (MLE)	27.59	nu star (bias corrected)	23.75
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (23.75, α)	13.66	Adjusted Chi Square Value (23.75, β)	12.79
95% Gamma Approximate UCL (use when n>=50)	1.151	95% Gamma Adjusted UCL (use when n<50)	1.228

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.689	SD (KM)	0.672
Variance (KM)	0.451	SE of Mean (KM)	0.181
k hat (KM)	1.053	k star (KM)	0.898
nu hat (KM)	33.71	nu star (KM)	28.72
theta hat (KM)	0.654	theta star (KM)	0.768
80% gamma percentile (KM)	1.118	90% gamma percentile (KM)	1.63
95% gamma percentile (KM)	2.146	99% gamma percentile (KM)	3.353

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (28.72, α)	17.49	Adjusted Chi Square Value (28.72, β)	16.5
95% Gamma Approximate KM-UCL (use when n>=50)	1.132	95% Gamma Adjusted KM-UCL (use when n<50)	1.2
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.94	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.185	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.68	Mean in Log Scale	-0.863
SD in Original Scale	0.68	SD in Log Scale	1.015
95% t UCL (assumes normality of ROS data)	0.978	95% Percentile Bootstrap UCL	0.957
95% BCA Bootstrap UCL	0.98	95% Bootstrap t UCL	1.075
95% H-UCL (Log ROS)	1.443		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.899	KM Geo Mean	0.407
KM SD (logged)	1.054	95% Critical H Value (KM-Log)	2.788
KM Standard Error of Mean (logged)	0.288	95% H-UCL (KM -Log)	1.514
KM SD (logged)	1.054	95% Critical H Value (KM-Log)	2.788
KM Standard Error of Mean (logged)	0.288		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.709	Mean in Log Scale	-0.927
SD in Original Scale	0.693	SD in Log Scale	1.212
95% t UCL (Assumes normality)	1.013	95% H-Stat UCL	2.141
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	1.007		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

RA_HS_SVOCs|Benzo(a)Pyrene|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	3
Minimum	0.032	Mean	0.627
Maximum	3	Median	0.26
SD	0.944	Std. Error of Mean	0.298
Coefficient of Variation	1.506	Skewness	2.181

Normal GOF Test

Shapiro Wilk Test Statistic	0.681	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.315	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1.174	95% Adjusted-CLT UCL (Chen-1995)	1.337
		95% Modified-t UCL (Johnson-1978)	1.208

Gamma GOF Test

A-D Test Statistic	0.409	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.765	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.197	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.278	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.645	k star (bias corrected MLE)	0.518
Theta hat (MLE)	0.971	Theta star (bias corrected MLE)	1.209
nu hat (MLE)	12.9	nu star (bias corrected)	10.36
MLE Mean (bias corrected)	0.627	MLE Sd (bias corrected)	0.87
		Approximate Chi Square Value (0.05)	4.169
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	3.513

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	1.557	95% Adjusted Gamma UCL (use when n<50)	1.848

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.965	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.133	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-3.442	Mean of logged Data	-1.416
Maximum of Logged Data	1.099	SD of logged Data	1.492

Assuming Lognormal Distribution

95% H-UCL	5.935	90% Chebyshev (MVUE) UCL	1.528
95% Chebyshev (MVUE) UCL	1.943	97.5% Chebyshev (MVUE) UCL	2.519
99% Chebyshev (MVUE) UCL	3.65		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1.117	95% Jackknife UCL	1.174
95% Standard Bootstrap UCL	1.093	95% Bootstrap-t UCL	2.709
95% Hall's Bootstrap UCL	3.371	95% Percentile Bootstrap UCL	1.131
95% BCA Bootstrap UCL	1.322		
90% Chebyshev(Mean, Sd) UCL	1.522	95% Chebyshev(Mean, Sd) UCL	1.927
97.5% Chebyshev(Mean, Sd) UCL	2.49	99% Chebyshev(Mean, Sd) UCL	3.596

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

Suggested UCL to Use	
95% Adjusted Gamma UCL	1.848

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

RA_HS_SVOCs|Benzo(b)fluoranthene|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
		Number of Missing Observations	3
Minimum	0.065	Mean	0.841
Maximum	4.3	Median	0.39
SD	1.302	Std. Error of Mean	0.412
Coefficient of Variation	1.548	Skewness	2.518

Normal GOF Test

Shapiro Wilk Test Statistic	0.642	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.316	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1.595	95% Adjusted-CLT UCL (Chen-1995)	1.868
		95% Modified-t UCL (Johnson-1978)	1.65

Gamma GOF Test

A-D Test Statistic	0.447	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.76	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.185	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.277	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.708	k star (bias corrected MLE)	0.562
Theta hat (MLE)	1.188	Theta star (bias corrected MLE)	1.495
nu hat (MLE)	14.16	nu star (bias corrected)	11.25
MLE Mean (bias corrected)	0.841	MLE Sd (bias corrected)	1.121
		Approximate Chi Square Value (0.05)	4.736
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	4.027

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	1.997	95% Adjusted Gamma UCL (use when n<50)	2.349

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.956	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.123	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.733	Mean of logged Data	-1.025
Maximum of Logged Data	1.459	SD of logged Data	1.367

Assuming Lognormal Distribution

95% H-UCL	5.408	90% Chebyshev (MVUE) UCL	1.867
95% Chebyshev (MVUE) UCL	2.357	97.5% Chebyshev (MVUE) UCL	3.036
99% Chebyshev (MVUE) UCL	4.37		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1.518	95% Jackknife UCL	1.595
95% Standard Bootstrap UCL	1.493	95% Bootstrap-t UCL	3.796
95% Hall's Bootstrap UCL	4.413	95% Percentile Bootstrap UCL	1.587
95% BCA Bootstrap UCL	1.922		
90% Chebyshev(Mean, Sd) UCL	2.076	95% Chebyshev(Mean, Sd) UCL	2.635
97.5% Chebyshev(Mean, Sd) UCL	3.411	99% Chebyshev(Mean, Sd) UCL	4.936

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

Suggested UCL to Use
95% Adjusted Gamma UCL 2.349

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

RA_HS_SVOCs|Dibenzo(a,h)Anthracene|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	3
Number of Detects	8	Number of Non-Detects	2
Number of Distinct Detects	8	Number of Distinct Non-Detects	2
Minimum Detect	0.017	Minimum Non-Detect	0.028
Maximum Detect	0.49	Maximum Non-Detect	0.041
Variance Detects	0.0268	Percent Non-Detects	20%
Mean Detects	0.117	SD Detects	0.164
Median Detects	0.052	CV Detects	1.395
Skewness Detects	2.13	Kurtosis Detects	4.534
Mean of Logged Detects	-2.855	SD of Logged Detects	1.232

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.689	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.34	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0978	KM Standard Error of Mean	0.0481
KM SD	0.142	95% KM (BCA) UCL	0.174
95% KM (t) UCL	0.186	95% KM (Percentile Bootstrap) UCL	0.178
95% KM (z) UCL	0.177	95% KM Bootstrap t UCL	0.51
90% KM Chebyshev UCL	0.242	95% KM Chebyshev UCL	0.308
97.5% KM Chebyshev UCL	0.398	99% KM Chebyshev UCL	0.577

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.559	Anderson-Darling GOF Test	
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.229	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.303	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.83	k star (bias corrected MLE)	0.602
Theta hat (MLE)	0.141	Theta star (bias corrected MLE)	0.195
nu hat (MLE)	13.27	nu star (bias corrected)	9.63
Mean (detects)	0.117		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0958
Maximum	0.49	Median	0.0285
SD	0.151	CV	1.578
k hat (MLE)	0.702	k star (bias corrected MLE)	0.558
Theta hat (MLE)	0.136	Theta star (bias corrected MLE)	0.172
nu hat (MLE)	14.05	nu star (bias corrected)	11.17
Adjusted Level of Significance (β)	0.0267		
Approximate Chi Square Value (11.17, α)	4.684	Adjusted Chi Square Value (11.17, β)	3.98
95% Gamma Approximate UCL (use when n>=50)	0.228	95% Gamma Adjusted UCL (use when n<50)	0.269

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0978	SD (KM)	0.142
Variance (KM)	0.0203	SE of Mean (KM)	0.0481
k hat (KM)	0.472	k star (KM)	0.397
nu hat (KM)	9.442	nu star (KM)	7.943
theta hat (KM)	0.207	theta star (KM)	0.246
80% gamma percentile (KM)	0.158	90% gamma percentile (KM)	0.277

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

95% gamma percentile (KM)	0.407	99% gamma percentile (KM)	0.736
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (7.94, α)	2.702	Adjusted Chi Square Value (7.94, β)	2.2
95% Gamma Approximate KM-UCL (use when n>=50)	0.287	95% Gamma Adjusted KM-UCL (use when n<50)	0.353
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.191	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.0978	Mean in Log Scale	-3.066
SD in Original Scale	0.15	SD in Log Scale	1.175
95% t UCL (assumes normality of ROS data)	0.185	95% Percentile Bootstrap UCL	0.18
95% BCA Bootstrap UCL	0.219	95% Bootstrap t UCL	0.526
95% H-UCL (Log ROS)	0.362		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-3.073	KM Geo Mean	0.0463
KM SD (logged)	1.124	95% Critical H Value (KM-Log)	3.362
KM Standard Error of Mean (logged)	0.382	95% H-UCL (KM -Log)	0.307
KM SD (logged)	1.124	95% Critical H Value (KM-Log)	3.362
KM Standard Error of Mean (logged)	0.382		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0973	Mean in Log Scale	-3.1
SD in Original Scale	0.15	SD in Log Scale	1.206
95% t UCL (Assumes normality)	0.184	95% H-Stat UCL	0.387
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM Bootstrap t UCL	0.51	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	0.353

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

RA_HS_SVOCs|Indeno(1,2,3-CD)Pyrene|mg/kg

General Statistics			
Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	3
Number of Detects	9	Number of Non-Detects	1
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	0.037	Minimum Non-Detect	0.041
Maximum Detect	3.3	Maximum Non-Detect	0.041
Variance Detects	1.094	Percent Non-Detects	10%
Mean Detects	0.558	SD Detects	1.046
Median Detects	0.18	CV Detects	1.875
Skewness Detects	2.817	Kurtosis Detects	8.13
Mean of Logged Detects	-1.571	SD of Logged Detects	1.366

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.541	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.36	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.506	KM Standard Error of Mean	0.318
KM SD	0.949	95% KM (BCA) UCL	1.111
95% KM (t) UCL	1.089	95% KM (Percentile Bootstrap) UCL	1.119
95% KM (z) UCL	1.029	95% KM Bootstrap t UCL	4.278
90% KM Chebyshev UCL	1.46	95% KM Chebyshev UCL	1.893
97.5% KM Chebyshev UCL	2.493	99% KM Chebyshev UCL	3.672

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.735	Anderson-Darling GOF Test	
5% A-D Critical Value	0.761	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.247	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.292	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.622	k star (bias corrected MLE)	0.489
Theta hat (MLE)	0.897	Theta star (bias corrected MLE)	1.142
nu hat (MLE)	11.2	nu star (bias corrected)	8.799
Mean (detects)	0.558		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.503
Maximum	3.3	Median	0.16
SD	1.001	CV	1.99
k hat (MLE)	0.53	k star (bias corrected MLE)	0.438
Theta hat (MLE)	0.95	Theta star (bias corrected MLE)	1.15
nu hat (MLE)	10.6	nu star (bias corrected)	8.752
Adjusted Level of Significance (β)	0.0267		
Approximate Chi Square Value (8.75, α)	3.178	Adjusted Chi Square Value (8.75, β)	2.623
95% Gamma Approximate UCL (use when n>=50)	1.386	95% Gamma Adjusted UCL (use when n<50)	1.679

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.506	SD (KM)	0.949
Variance (KM)	0.9	SE of Mean (KM)	0.318
k hat (KM)	0.284	k star (KM)	0.266
nu hat (KM)	5.688	nu star (KM)	5.315
theta hat (KM)	1.779	theta star (KM)	1.904
80% gamma percentile (KM)	0.75	90% gamma percentile (KM)	1.511

Off-Project Red Maple Swamp/Tidal Stream Area Surface Hydric Soil

95% gamma percentile (KM)	2.404	99% gamma percentile (KM)	4.761
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (5.32, α)	1.301	Adjusted Chi Square Value (5.32, β)	0.99
95% Gamma Approximate KM-UCL (use when n>=50)	2.068	95% Gamma Adjusted KM-UCL (use when n<50)	2.716
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.946	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.137	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.504	Mean in Log Scale	-1.802
SD in Original Scale	1.001	SD in Log Scale	1.48
95% t UCL (assumes normality of ROS data)	1.084	95% Percentile Bootstrap UCL	1.098
95% BCA Bootstrap UCL	1.431	95% Bootstrap t UCL	4.067
95% H-UCL (Log ROS)	3.838		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-1.744	KM Geo Mean	0.175
KM SD (logged)	1.327	95% Critical H Value (KM-Log)	3.81
KM Standard Error of Mean (logged)	0.445	95% H-UCL (KM -Log)	2.275
KM SD (logged)	1.327	95% Critical H Value (KM-Log)	3.81
KM Standard Error of Mean (logged)	0.445		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.504	Mean in Log Scale	-1.803
SD in Original Scale	1.001	SD in Log Scale	1.482
95% t UCL (Assumes normality)	1.084	95% H-Stat UCL	3.862
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM Bootstrap t UCL	4.278	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	2.716

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL Input/Output
Off-Project Red Maple Swamp / Tidal Stream Area Subsurface Hydric Soil

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Hydric Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_HS_Metals|Thallium|mg/kg	D_RA_HS_Metals|Thallium|mg/kg
HS	T	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	1 - 2 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	1 - 2 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	1 - 2 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:05 AM	1 - 2 ft	0.24	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:25 AM	1 - 2 ft	0.132	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:45 AM	1 - 2 ft	0.21	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:05 AM	1 - 2 ft	0.029	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:25 AM	1 - 2 ft	0.13	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:45 AM	1 - 2 ft	0.085	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:05 AM	1 - 2 ft	0.13	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:25 AM	1 - 2 ft	0.12	1
HS	T	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:45 AM	1 - 2 ft	0.026	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:05 AM	1 - 2 ft	0.1	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	1 - 2 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	1 - 2 ft		
HS	T	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	1 - 2 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Hydric Soil

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_HS_Pest_PCBs|Total PCB Aroclors|mg/kg	D_RA_HS_Pest_PCBs|Total PCB Aroclors|mg/kg
HS	T	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	1 - 2 ft	1.3	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	1 - 2 ft	1.8	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	1 - 2 ft	2.2	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:05 AM	1 - 2 ft	0.48	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:25 AM	1 - 2 ft	0.39	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:45 AM	1 - 2 ft	0.38	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:05 AM	1 - 2 ft	0.22	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:25 AM	1 - 2 ft	0.29	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:45 AM	1 - 2 ft	0.24	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:05 AM	1 - 2 ft	0.23	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:25 AM	1 - 2 ft	0.19	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:45 AM	1 - 2 ft	0.079	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:05 AM	1 - 2 ft	0.16	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	1 - 2 ft	2.7	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	1 - 2 ft	1.9	0
HS	T	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	1 - 2 ft	2.2	1

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Hydric Soil

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.110/5/2020 9:51:43 AM
From File	Input_HS_Subsurface.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_HS_Metals|Thallium|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
		Number of Missing Observations	3
Number of Detects	5	Number of Non-Detects	5
Number of Distinct Detects	5	Number of Distinct Non-Detects	5
Minimum Detect	0.029	Minimum Non-Detect	0.026
Maximum Detect	0.132	Maximum Non-Detect	0.24
Variance Detects	0.0019	Percent Non-Detects	50%
Mean Detects	0.0992	SD Detects	0.0436
Median Detects	0.12	CV Detects	0.439
Skewness Detects	-1.389	Kurtosis Detects	1.232
Mean of Logged Detects	-2.438	SD of Logged Detects	0.641

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.829	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.284	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0788	KM Standard Error of Mean	0.0193
KM SD	0.0447	95% KM (BCA) UCL	0.111
95% KM (t) UCL	0.114	95% KM (Percentile Bootstrap) UCL	0.111
95% KM (z) UCL	0.111	95% KM Bootstrap t UCL	0.106
90% KM Chebyshev UCL	0.137	95% KM Chebyshev UCL	0.163
97.5% KM Chebyshev UCL	0.199	99% KM Chebyshev UCL	0.271

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.652	Anderson-Darling GOF Test	
5% A-D Critical Value	0.681	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.312	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	4.078	k star (bias corrected MLE)	1.765
Theta hat (MLE)	0.0243	Theta star (bias corrected MLE)	0.0562
nu hat (MLE)	40.78	nu star (bias corrected)	17.65
Mean (detects)	0.0992		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.029	Mean	0.079
Maximum	0.132	Median	0.0744
SD	0.038	CV	0.48
k hat (MLE)	4.281	k star (bias corrected MLE)	3.063
Theta hat (MLE)	0.0185	Theta star (bias corrected MLE)	0.0258
nu hat (MLE)	85.61	nu star (bias corrected)	61.26
Adjusted Level of Significance (β)	0.0267		

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Hydric Soil

Approximate Chi Square Value (61.26, α)	44.26	Adjusted Chi Square Value (61.26, β)	41.76
95% Gamma Approximate UCL (use when n>=50)	0.109	95% Gamma Adjusted UCL (use when n<50)	0.116

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0788	SD (KM)	0.0447
Variance (KM)	0.002	SE of Mean (KM)	0.0193
k hat (KM)	3.105	k star (KM)	2.24
nu hat (KM)	62.1	nu star (KM)	44.8
theta hat (KM)	0.0254	theta star (KM)	0.0352
80% gamma percentile (KM)	0.116	90% gamma percentile (KM)	0.149
95% gamma percentile (KM)	0.18	99% gamma percentile (KM)	0.249

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (44.80, α)	30.45	Adjusted Chi Square Value (44.80, β)	28.41
95% Gamma Approximate KM-UCL (use when n>=50)	0.116	95% Gamma Adjusted KM-UCL (use when n<50)	0.124

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.748	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.29	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.074	Mean in Log Scale	-2.755
SD in Original Scale	0.0407	SD in Log Scale	0.599
95% t UCL (assumes normality of ROS data)	0.0976	95% Percentile Bootstrap UCL	0.0951
95% BCA Bootstrap UCL	0.0959	95% Bootstrap t UCL	0.101
95% H-UCL (Log ROS)	0.122		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.757	KM Geo Mean	0.0635
KM SD (logged)	0.701	95% Critical H Value (KM-Log)	2.533
KM Standard Error of Mean (logged)	0.312	95% H-UCL (KM -Log)	0.147
KM SD (logged)	0.701	95% Critical H Value (KM-Log)	2.533
KM Standard Error of Mean (logged)	0.312		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0849	Mean in Log Scale	-2.664
SD in Original Scale	0.0435	SD in Log Scale	0.767
95% t UCL (Assumes normality)	0.11	95% H-Stat UCL	0.184

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.114

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Subsurface Hydric Soil

RA_HS_Pest_PCBs|Total PCB Aroclors|mg/kg

General Statistics			
Total Number of Observations	16	Number of Distinct Observations	15
Number of Detects	1	Number of Non-Detects	15
Number of Distinct Detects	1	Number of Distinct Non-Detects	15

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable RA_HS_Pest_PCBs|Total PCB Aroclors|mg/kg was not processed!

ProUCL Input/Output
On-Project Blue Beach Area Groundwater

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_Metals|Antimony|ug/l	D_RA_WG_Metals|Antimony|ug/l	RA_WG_Metals|Arsenic|ug/l	D_RA_WG_Metals|Arsenic|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.2	1	11.5	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.12	1	8.9	1
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft			1	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0	4	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0	4	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0	4	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	2.22	1	4	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft			3.1	1
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0	2.9	1
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0	4	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0	4	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft			1	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.5	0	4	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft			4.8	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft				
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0	3	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft			0.7	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft			10.8	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft			3.6	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft			0.5	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft			3.2	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft			5.9	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft			1.7	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft			,	
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft			3	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft			3	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft			0.6	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft				
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft			5.7	1
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft			0.7	1

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_Metals|Barium|ug/l	D_RA_WG_Metals|Barium|ug/l	RA_WG_Metals|Cadmium|ug/l	D_RA_WG_Metals|Cadmium|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	50.9	1	0.225	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	77.8	1	0.2	0
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	8.5	1	0.1	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	9.86	1	0.039	1
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	3	0	0.1	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	1.6	1	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	12.2	1	0.1	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	11.6	1	0.035	1
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	5.5	1	0.1	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	14.3	1	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	46.3	1	0.1	0
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	104	1	2.8	1
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	92.1	1	1.16	1
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	4.8	1	0.12	1
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	4.91	1	0.16	1
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	80.3	1		
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	99.1	1	31.2	1
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	24.8	1	0.26	1
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	6.05	1	0.23	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	17.3	1	1.89	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft				
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	14.5	1	0.2	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	9.9	1	0.1	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	587	1	4.81	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	377	1	2.84	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	20.4	1	0.1	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	25.2	1	0.1	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	19.3	1	0.1	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	237	1	1.91	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	12.7	1	0.075	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	39.9	1	0.1	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	12.1	1	0.1	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft				
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	20.6	1	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	43.5	1	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	18.6	1	0.05	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	17.5	1	0.05	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	27.3	1	0.17	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft				
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	852	1	3.92	1
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	25.4	1	0.09	1
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	17.2	1	0.18	1
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	24.1	1	0.07	1

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_Metals|Chromium|ug/l	D_RA_WG_Metals|Chromium|ug/l	RA_WG_Metals|Cobalt|ug/l	D_RA_WG_Metals|Cobalt|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	4	0	1.9	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	4	0	0.3	0
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	3	0		
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	4	0	0.11	1
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	3	0		
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	4	0	0.14	1
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	3	0		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	4	0	0.881	1
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	3	0		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	4	0	0.12	1
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	3	0		
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	3	0		
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	4	0	1.04	1
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	3	0		
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	4	0	0.944	1
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	2.1	1		
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	9.68	1	0.3	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	3	0		
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	4	0	3.48	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	6.1	1		
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft				
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	4	0	6.56	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	3	0		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	63.3	1		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	63.5	1		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	24.1	1		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	3	0		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	33.4	1		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	276	1		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	3	0		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	60.8	1		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	16.8	1		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft				
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	1.5	1		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	3	0		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	3	1		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	3.2	1		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	26.2	1		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft				
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	624	1		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	19.4	1		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	3	0		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	39.7	1		

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_Metals|Iron|ug/l	D_RA_WG_Metals|Iron|ug/l	RA_WG_Metals|Lead|ug/l	D_RA_WG_Metals|Lead|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	68200	1	0.59	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	57400	1	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft			1	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	60	0	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	60	0	0.24	1
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	61	1	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	80	1	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	6060	1	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	581	1	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	65	1	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft			1	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	60	0	0.081	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft			0.8	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft				
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	6450	1	0.18	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft			229	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft			145	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft			3	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft			1.3	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft			6.2	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft			76.5	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft			5	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft			2.6	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft				
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft			3.4	1
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft			2.6	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft			0.7	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft			4.2	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft				
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft			275	1
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft			0.7	1
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft			2.2	1

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_Metals|Manganese|ug/l	D_RA_WG_Metals|Manganese|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	2340	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	1750	1
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft		
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	2.3	1
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	3.4	1
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	1.4	1
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	4.44	1
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	38	1
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft		
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	1340	1
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	3.4	1
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft		
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	654	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	3180	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft		

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_SVOCs-SIM|1-Methylnaphthalene|ug/l	D_RA_WG_SVOCs-SIM|1-Methylnaphthalene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	74	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	90	1
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft		
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.38	1
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft		
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.098	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft		
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft		

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_SVOCs-SIM|2-Methylnaphthalene|ug/l	D_RA_WG_SVOCs-SIM|2-Methylnaphthalene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	31.5	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	85	1
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft		
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft		
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.098	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft		
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft		

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_SVOCs-SIM|Benzo(a)anthracene|ug/l	D_RA_WG_SVOCs-SIM|Benzo(a)anthracene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.051	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.096	1
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft		
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.24	1
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.26	1
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft		
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.098	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft		
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.052	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft		

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_SVOCs-SIM|Benzo(a)Pyrene|ug/l	D_RA_WG_SVOCs-SIM|Benzo(a)Pyrene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.0745	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.22	1
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft		
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.22	1
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft		
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.098	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft		
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.093	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft		

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_SVOCs-SIM|Benzo(b)fluoranthene|ug/l	D_RA_WG_SVOCs-SIM|Benzo(b)fluoranthene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.38	1
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft		
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.24	1
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.24	1
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft		
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.098	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft		
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.095	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft		

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_SVOCs-SIM|Naphthalene|ug/l	D_RA_WG_SVOCs-SIM|Naphthalene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	160	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	250	1
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft		
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.092	1
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft		
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.098	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft		
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft		
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft		

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|1,1,2,2-Tetrachloroethane|ug/l	D_RA_WG_VOCs_VPHs|1,1,2,2-Tetrachloroethane|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	0.2	1
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	2	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.25	0

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|1,1,2-Trichloroethane|ug/l	D_RA_WG_VOCs_VPHs|1,1,2-Trichloroethane|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	0.4	1
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	5	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	0.37	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.25	0

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|1,1-Dichloroethane|ug/l	D_RA_WG_VOCs_VPHs|1,1-Dichloroethane|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	5	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.12	1
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.13	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	0.29	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.26	1
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	3.2	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.25	0

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|1,2,4-Trimethylbenzene|ug/l	D_RA_WG_VOCs_VPHs|1,2,4-Trimethylbenzene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	8.1	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	320	1
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.3	1
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	0.3	1
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.26	1
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	2	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	11	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	0.08	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	0.14	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.25	0

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|1,2-Dichloropropane|ug/l	D_RA_WG_VOCs_VPHs|1,2-Dichloropropane|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	5	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.94	1
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.25	0

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|Chloroform|ug/l	D_RA_WG_VOCs_VPHs|Chloroform|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	5	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.13	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	0.1	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.19	1
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	0.63	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.25	0

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|cis-1,2-Dichloroethene|ug/l	D_RA_WG_VOCs_VPHs|cis-1,2-Dichloroethene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	3.1	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	5.5	1
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	0.2	1
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.77	1
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	39.2	1
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	8.4	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	10.7	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	8	1
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.72	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	9.5	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	0.13	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	2.3	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	0.9	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	1.5	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	0.38	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	1.7	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	2.7	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	2.2	1
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	1.7	1
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	39	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.25	0

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|Ethylbenzene|ug/l	D_RA_WG_VOCs_VPHs|Ethylbenzene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	4.3	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	4.8	1
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.2	1
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	2	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	7.5	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.08	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	0.09	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.25	0

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|Naphthalene|ug/l	D_RA_WG_VOCs_VPHs|Naphthalene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft		
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft		
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft		
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft		
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.8	1
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	0.3	1
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft		
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft		
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft		
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	5	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft		
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	780	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	1	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	0.65	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	1.5	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	0.2	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	0.97	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	0.18	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.19	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.21	1

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|Tetrachloroethene|ug/l	D_RA_WG_VOCs_VPHs|Tetrachloroethene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	0.6	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	5.8	1
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	1.7	1
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	1.5	1
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	5	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	1.4	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.4	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.37	1
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	1.5	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.14	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	0.14	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	0.6	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	0.13	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.61	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	0.23	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	0.18	1
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	1.8	1
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	3.7	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.22	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.25	0

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|Total Xylenes|ug/l	D_RA_WG_VOCs_VPHs|Total Xylenes|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	41	1
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	0.6	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.6	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.6	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.6	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.6	0
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	0.6	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.6	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	0.6	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	6	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.6	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	21	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.36	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	0.38	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	0.62	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	0.34	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	0.31	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.75	0

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|Trichloroethylene|ug/l	D_RA_WG_VOCs_VPHs|Trichloroethylene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	26.1	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	28	1
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	0.4	1
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	1.6	1
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	1.4	1
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	134	1
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	46	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	5.1	1
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	4.4	1
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	3.3	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	12	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.11	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	0.49	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	12	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	5.1	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	0.6	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	3.5	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	74	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	21	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	11	1
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	75	1
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	180	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	1.4	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.43	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	1.1	1
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.25	0

On-Project Blue Beach Area Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|Vinyl Chloride|ug/l	D_RA_WG_VOCs_VPHs|Vinyl Chloride|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	1	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	1	0
WG	T	GW-OnProject_BlueBeach	BMW-3	7/23/2014 12:00 AM	7.32 - 17.39 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	1	0
WG	T	GW-OnProject_BlueBeach	MW-101D	7/22/2014 12:00 AM	13 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	1	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	1	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	1	0
WG	T	GW-OnProject_BlueBeach	MW-105	7/22/2014 12:00 AM	9 - 19 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	7/22/2014 12:00 AM	8 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	1	0
WG	T	GW-OnProject_BlueBeach	MW-108D	7/23/2014 12:00 AM	32.7 - 37.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	1	0
WG	T	GW-OnProject_BlueBeach	MW-108S	7/23/2014 12:00 AM	8 - 18 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	1	0
WG	T	GW-OnProject_BlueBeach	OW-3	7/23/2014 12:00 AM	20.5 - 30.5 ft	5	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	1	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	7/23/2014 12:00 AM	10 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	1	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	17 - 20 ft	2	1
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-A	7/21/2014 12:00 AM	28 - 30 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	15 - 17 ft	1.2	1
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/21/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	25 - 26 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-B	7/22/2014 12:00 AM	30 - 31 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	18 - 20 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	23 - 24 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	19 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	18 - 21 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	27 - 27 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	30 - 33 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	39 - 40 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/23/2014 12:00 AM	22 - 25 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	18 - 21 ft	0.25	0

On-Project Blue Beach Area Groundwater

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/29/2020 2:25:29 PM
From File	Input_GW.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_WG_Metals|Antimony|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	4
		Number of Missing Observations	11
Number of Detects	3	Number of Non-Detects	8
Number of Distinct Detects	3	Number of Distinct Non-Detects	1
Minimum Detect	0.12	Minimum Non-Detect	0.5
Maximum Detect	2.22	Maximum Non-Detect	0.5
Variance Detects	1.416	Percent Non-Detects	72.73%
Mean Detects	0.847	SD Detects	1.19
Median Detects	0.2	CV Detects	1.406
Skewness Detects	1.723	Kurtosis Detects	N/A
Mean of Logged Detects	-0.977	SD of Logged Detects	1.558

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.779	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.373	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.347	KM Standard Error of Mean	0.221
KM SD	0.593	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.748	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.711	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.01	95% KM Chebyshev UCL	1.31
97.5% KM Chebyshev UCL	1.727	99% KM Chebyshev UCL	2.546

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.74	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.145	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.438	nu star (bias corrected)	N/A
Mean (detects)	0.847		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.438
Maximum	2.22	Median	0.2
SD	0.661	CV	1.511
k hat (MLE)	0.523	k star (bias corrected MLE)	0.441
Theta hat (MLE)	0.837	Theta star (bias corrected MLE)	0.993
nu hat (MLE)	11.5	nu star (bias corrected)	9.7
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (9.70, α)	3.755	Adjusted Chi Square Value (9.70, β)	3.176

On-Project Blue Beach Area Groundwater

95% Gamma Approximate UCL (use when n>=50)	1.13	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.347	SD (KM)	0.593
Variance (KM)	0.352	SE of Mean (KM)	0.221
k hat (KM)	0.342	k star (KM)	0.31
nu hat (KM)	7.534	nu star (KM)	6.813
theta hat (KM)	1.014	theta star (KM)	1.121
80% gamma percentile (KM)	0.537	90% gamma percentile (KM)	1.02
95% gamma percentile (KM)	1.572	99% gamma percentile (KM)	3.002

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.81, α)	2.068	Adjusted Chi Square Value (6.81, β)	1.67
95% Gamma Approximate KM-UCL (use when n>=50)	1.144	95% Gamma Adjusted KM-UCL (use when n<50)	1.417

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.877	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.324	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.4	Mean in Log Scale	-1.602
SD in Original Scale	0.629	SD in Log Scale	1.149
95% t UCL (assumes normality of ROS data)	0.744	95% Percentile Bootstrap UCL	0.744
95% BCA Bootstrap UCL	0.957	95% Bootstrap t UCL	1.692
95% H-UCL (Log ROS)	1.29		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.623	KM Geo Mean	0.197
KM SD (logged)	0.803	95% Critical H Value (KM-Log)	2.637
KM Standard Error of Mean (logged)	0.347	95% H-UCL (KM -Log)	0.532
KM SD (logged)	0.803	95% Critical H Value (KM-Log)	2.637
KM Standard Error of Mean (logged)	0.347		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.413	Mean in Log Scale	-1.275
SD in Original Scale	0.601	SD in Log Scale	0.723
95% t UCL (Assumes normality)	0.741	95% H-Stat UCL	0.643

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.748

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Groundwater

RA_WG_Metals|Arsenic|ug/l

General Statistics

Total Number of Observations	40	Number of Distinct Observations	17
		Number of Missing Observations	3
Number of Detects	16	Number of Non-Detects	24
Number of Distinct Detects	15	Number of Distinct Non-Detects	3
Minimum Detect	0.5	Minimum Non-Detect	1
Maximum Detect	11.5	Maximum Non-Detect	4
Variance Detects	12.5	Percent Non-Detects	60%
Mean Detects	4.225	SD Detects	3.536
Median Detects	3.15	CV Detects	0.837
Skewness Detects	0.982	Kurtosis Detects	0.0415
Mean of Logged Detects	1.028	SD of Logged Detects	1.034

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.874	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.195	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.164	KM Standard Error of Mean	0.462
KM SD	2.783	95% KM (BCA) UCL	2.977
95% KM (t) UCL	2.943	95% KM (Percentile Bootstrap) UCL	2.931
95% KM (z) UCL	2.924	95% KM Bootstrap t UCL	3.202
90% KM Chebyshev UCL	3.551	95% KM Chebyshev UCL	4.179
97.5% KM Chebyshev UCL	5.051	99% KM Chebyshev UCL	6.763

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.383	Anderson-Darling GOF Test	
5% A-D Critical Value	0.757	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.153	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.22	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.352	k star (bias corrected MLE)	1.14
Theta hat (MLE)	3.124	Theta star (bias corrected MLE)	3.705
nu hat (MLE)	43.27	nu star (bias corrected)	36.49
Mean (detects)	4.225		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.079
Maximum	11.5	Median	0.82
SD	2.903	CV	1.396
k hat (MLE)	0.389	k star (bias corrected MLE)	0.377
Theta hat (MLE)	5.34	Theta star (bias corrected MLE)	5.517
nu hat (MLE)	31.14	nu star (bias corrected)	30.14
Adjusted Level of Significance (β)	0.044		
Approximate Chi Square Value (30.14, α)	18.6	Adjusted Chi Square Value (30.14, β)	18.26
95% Gamma Approximate UCL (use when n>=50)	3.368	95% Gamma Adjusted UCL (use when n<50)	3.43

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.164	SD (KM)	2.783
Variance (KM)	7.744	SE of Mean (KM)	0.462
k hat (KM)	0.605	k star (KM)	0.576
nu hat (KM)	48.39	nu star (KM)	46.09
theta hat (KM)	3.578	theta star (KM)	3.756
80% gamma percentile (KM)	3.567	90% gamma percentile (KM)	5.68

On-Project Blue Beach Area Groundwater

95% gamma percentile (KM)	7.902	99% gamma percentile (KM)	13.3

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (46.09, α)	31.51	Adjusted Chi Square Value (46.09, β)	31.06
95% Gamma Approximate KM-UCL (use when n>=50)	3.165	95% Gamma Adjusted KM-UCL (use when n<50)	3.211

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.914	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.202	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.242	Mean in Log Scale	0.23
SD in Original Scale	2.777	SD in Log Scale	1.068
95% t UCL (assumes normality of ROS data)	2.982	95% Percentile Bootstrap UCL	3.006
95% BCA Bootstrap UCL	3.184	95% Bootstrap t UCL	3.271
95% H-UCL (Log ROS)	3.407		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.19	KM Geo Mean	1.21
KM SD (logged)	0.987	95% Critical H Value (KM-Log)	2.393
KM Standard Error of Mean (logged)	0.175	95% H-UCL (KM -Log)	2.874
KM SD (logged)	0.987	95% Critical H Value (KM-Log)	2.393
KM Standard Error of Mean (logged)	0.175		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.303	Mean in Log Scale	0.293
SD in Original Scale	2.761	SD in Log Scale	1.018
95% t UCL (Assumes normality)	3.038	95% H-Stat UCL	3.342

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	2.943

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_Metals|Barium|ug/l

General Statistics

Total Number of Observations	40	Number of Distinct Observations	40
		Number of Missing Observations	3
Number of Detects	39	Number of Non-Detects	1
Number of Distinct Detects	39	Number of Distinct Non-Detects	1
Minimum Detect	1.6	Minimum Non-Detect	3
Maximum Detect	852	Maximum Non-Detect	3
Variance Detects	28514	Percent Non-Detects	2.5%
Mean Detects	78.8	SD Detects	168.9
Median Detects	20.4	CV Detects	2.143
Skewness Detects	3.553	Kurtosis Detects	13.17
Mean of Logged Detects	3.284	SD of Logged Detects	1.336

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.471	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.939	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.338	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.14	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	76.87	KM Standard Error of Mean	26.43
KM SD	165	95% KM (BCA) UCL	129.3
95% KM (t) UCL	121.4	95% KM (Percentile Bootstrap) UCL	123
95% KM (z) UCL	120.3	95% KM Bootstrap t UCL	178.5
90% KM Chebyshev UCL	156.2	95% KM Chebyshev UCL	192.1
97.5% KM Chebyshev UCL	241.9	99% KM Chebyshev UCL	339.9

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.101	Anderson-Darling GOF Test	
5% A-D Critical Value	0.806	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.253	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.149	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.574	k star (bias corrected MLE)	0.547
Theta hat (MLE)	137.2	Theta star (bias corrected MLE)	144
nu hat (MLE)	44.79	nu star (bias corrected)	42.68
Mean (detects)	78.8		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	76.83
Maximum	852	Median	19.85
SD	167.1	CV	2.176
k hat (MLE)	0.505	k star (bias corrected MLE)	0.484
Theta hat (MLE)	152	Theta star (bias corrected MLE)	158.7
nu hat (MLE)	40.43	nu star (bias corrected)	38.73
Adjusted Level of Significance (β)	0.044		
Approximate Chi Square Value (38.73, α)	25.47	Adjusted Chi Square Value (38.73, β)	25.07
95% Gamma Approximate UCL (use when n>=50)	116.8	95% Gamma Adjusted UCL (use when n<50)	118.7

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	76.87	SD (KM)	165
Variance (KM)	27233	SE of Mean (KM)	26.43
k hat (KM)	0.217	k star (KM)	0.217
nu hat (KM)	17.36	nu star (KM)	17.39
theta hat (KM)	354.3	theta star (KM)	353.6
80% gamma percentile (KM)	105.5	90% gamma percentile (KM)	232.3

On-Project Blue Beach Area Groundwater

95% gamma percentile (KM)	387.3	99% gamma percentile (KM)	808.6

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (17.39, α)	8.951	Adjusted Chi Square Value (17.39, β)	8.723
95% Gamma Approximate KM-UCL (use when n>=50)	149.3	95% Gamma Adjusted KM-UCL (use when n<50)	153.2

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.948	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.939	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.16	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.14	Detected Data Not Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	76.87	Mean in Log Scale	3.212
SD in Original Scale	167.1	SD in Log Scale	1.396
95% t UCL (assumes normality of ROS data)	121.4	95% Percentile Bootstrap UCL	120.4
95% BCA Bootstrap UCL	144.4	95% Bootstrap t UCL	176.3
95% H-UCL (Log ROS)	125.8		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.214	KM Geo Mean	24.87
KM SD (logged)	1.374	95% Critical H Value (KM-Log)	2.878
KM Standard Error of Mean (logged)	0.22	95% H-UCL (KM -Log)	120.4
KM SD (logged)	1.374	95% Critical H Value (KM-Log)	2.878
KM Standard Error of Mean (logged)	0.22		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	76.87	Mean in Log Scale	3.212
SD in Original Scale	167.1	SD in Log Scale	1.395
95% t UCL (Assumes normality)	121.4	95% H-Stat UCL	125.7

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	120.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_Metals|Cadmium|ug/l

General Statistics

Total Number of Observations	39	Number of Distinct Observations	24
		Number of Missing Observations	4
Number of Detects	23	Number of Non-Detects	16
Number of Distinct Detects	22	Number of Distinct Non-Detects	3
Minimum Detect	0.035	Minimum Non-Detect	0.1
Maximum Detect	31.2	Maximum Non-Detect	0.5
Variance Detects	41.7	Percent Non-Detects	41.03%
Mean Detects	2.278	SD Detects	6.458
Median Detects	0.18	CV Detects	2.835
Skewness Detects	4.449	Kurtosis Detects	20.59
Mean of Logged Detects	-1.061	SD of Logged Detects	1.883

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.366	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.914	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.364	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.18	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.371	KM Standard Error of Mean	0.814
KM SD	4.97	95% KM (BCA) UCL	3.057
95% KM (t) UCL	2.743	95% KM (Percentile Bootstrap) UCL	2.948
95% KM (z) UCL	2.71	95% KM Bootstrap t UCL	7.307
90% KM Chebyshev UCL	3.812	95% KM Chebyshev UCL	4.918
97.5% KM Chebyshev UCL	6.453	99% KM Chebyshev UCL	9.468

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.955	Anderson-Darling GOF Test	
5% A-D Critical Value	0.837	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.297	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.195	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.356	k star (bias corrected MLE)	0.338
Theta hat (MLE)	6.4	Theta star (bias corrected MLE)	6.73
nu hat (MLE)	16.37	nu star (bias corrected)	15.57
Mean (detects)	2.278		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.347
Maximum	31.2	Median	0.05
SD	5.042	CV	3.742
k hat (MLE)	0.252	k star (bias corrected MLE)	0.25
Theta hat (MLE)	5.344	Theta star (bias corrected MLE)	5.393
nu hat (MLE)	19.67	nu star (bias corrected)	19.49
Adjusted Level of Significance (β)	0.0437		
Approximate Chi Square Value (19.49, α)	10.47	Adjusted Chi Square Value (19.49, β)	10.21
95% Gamma Approximate UCL (use when n>=50)	2.507	95% Gamma Adjusted UCL (use when n<50)	2.571

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.371	SD (KM)	4.97
Variance (KM)	24.71	SE of Mean (KM)	0.814
k hat (KM)	0.0761	k star (KM)	0.0873
nu hat (KM)	5.935	nu star (KM)	6.812
theta hat (KM)	18.02	theta star (KM)	15.7
80% gamma percentile (KM)	0.767	90% gamma percentile (KM)	3.422

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95% gamma percentile (KM)	7.989	99% gamma percentile (KM)	23.28

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.81, α)	2.068	Adjusted Chi Square Value (6.81, β)	1.966
95% Gamma Approximate KM-UCL (use when n>=50)	4.516	95% Gamma Adjusted KM-UCL (use when n<50)	4.749

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.901	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.914	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.212	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.18	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.374	Mean in Log Scale	-1.844
SD in Original Scale	5.035	SD in Log Scale	1.83
95% t UCL (assumes normality of ROS data)	2.733	95% Percentile Bootstrap UCL	2.909
95% BCA Bootstrap UCL	4.034	95% Bootstrap t UCL	7.214
95% H-UCL (Log ROS)	2.393		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.773	KM Geo Mean	0.17
KM SD (logged)	1.675	95% Critical H Value (KM-Log)	3.284
KM Standard Error of Mean (logged)	0.282	95% H-UCL (KM -Log)	1.686
KM SD (logged)	1.675	95% Critical H Value (KM-Log)	3.284
KM Standard Error of Mean (logged)	0.282		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.379	Mean in Log Scale	-1.701
SD in Original Scale	5.033	SD in Log Scale	1.669
95% t UCL (Assumes normality)	2.738	95% H-Stat UCL	1.781

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	4.918

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_Metals|Chromium|ug/l

General Statistics

Total Number of Observations	40	Number of Distinct Observations	18
		Number of Missing Observations	3
Number of Detects	17	Number of Non-Detects	23
Number of Distinct Detects	17	Number of Distinct Non-Detects	2
Minimum Detect	1.5	Minimum Non-Detect	3
Maximum Detect	624	Maximum Non-Detect	4
Variance Detects	24173	Percent Non-Detects	57.5%
Mean Detects	74.87	SD Detects	155.5
Median Detects	24.1	CV Detects	2.077
Skewness Detects	3.22	Kurtosis Detects	10.8
Mean of Logged Detects	3.022	SD of Logged Detects	1.661

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.499	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.892	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.412	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.207	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	32.89	KM Standard Error of Mean	17.07
KM SD	104.7	95% KM (BCA) UCL	65.23
95% KM (t) UCL	61.66	95% KM (Percentile Bootstrap) UCL	61.65
95% KM (z) UCL	60.97	95% KM Bootstrap t UCL	177
90% KM Chebyshev UCL	84.11	95% KM Chebyshev UCL	107.3
97.5% KM Chebyshev UCL	139.5	99% KM Chebyshev UCL	202.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.87	Anderson-Darling GOF Test	
5% A-D Critical Value	0.8	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.238	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.221	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.492	k star (bias corrected MLE)	0.445
Theta hat (MLE)	152.1	Theta star (bias corrected MLE)	168.4
nu hat (MLE)	16.73	nu star (bias corrected)	15.11
Mean (detects)	74.87		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	31.83
Maximum	624	Median	0.01
SD	106.4	CV	3.343
k hat (MLE)	0.158	k star (bias corrected MLE)	0.163
Theta hat (MLE)	201.3	Theta star (bias corrected MLE)	195.3
nu hat (MLE)	12.65	nu star (bias corrected)	13.03
Adjusted Level of Significance (β)	0.044		
Approximate Chi Square Value (13.03, α)	5.915	Adjusted Chi Square Value (13.03, β)	5.735
95% Gamma Approximate UCL (use when n>=50)	70.12	95% Gamma Adjusted UCL (use when n<50)	72.32

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	32.89	SD (KM)	104.7
Variance (KM)	10972	SE of Mean (KM)	17.07
k hat (KM)	0.0986	k star (KM)	0.108
nu hat (KM)	7.889	nu star (KM)	8.631
theta hat (KM)	333.6	theta star (KM)	304.9
80% gamma percentile (KM)	25.34	90% gamma percentile (KM)	90.13

On-Project Blue Beach Area Groundwater

95% gamma percentile (KM)	189.9	99% gamma percentile (KM)	502.9

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.63, α)	3.105	Adjusted Chi Square Value (8.63, β)	2.982
95% Gamma Approximate KM-UCL (use when n>=50)	91.42	95% Gamma Adjusted KM-UCL (use when n<50)	95.2

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.965	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.892	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.131	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.207	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	32.8	Mean in Log Scale	1.236
SD in Original Scale	106.1	SD in Log Scale	2.119
95% t UCL (assumes normality of ROS data)	61.07	95% Percentile Bootstrap UCL	63.67
95% BCA Bootstrap UCL	83.02	95% Bootstrap t UCL	176.3
95% H-UCL (Log ROS)	124.3		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.631	KM Geo Mean	5.107
KM SD (logged)	1.6	95% Critical H Value (KM-Log)	3.189
KM Standard Error of Mean (logged)	0.271	95% H-UCL (KM -Log)	41.56
KM SD (logged)	1.6	95% Critical H Value (KM-Log)	3.189
KM Standard Error of Mean (logged)	0.271		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	32.81	Mean in Log Scale	1.589
SD in Original Scale	106.1	SD in Log Scale	1.643
95% t UCL (Assumes normality)	61.07	95% H-Stat UCL	44.48

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	107.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_Metals|Cobalt|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
		Number of Missing Observations	11
Number of Detects	9	Number of Non-Detects	2
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	0.11	Minimum Non-Detect	0.3
Maximum Detect	6.56	Maximum Non-Detect	0.3
Variance Detects	4.495	Percent Non-Detects	18.18%
Mean Detects	1.686	SD Detects	2.12
Median Detects	0.944	CV Detects	1.257
Skewness Detects	1.836	Kurtosis Detects	3.295
Mean of Logged Detects	-0.297	SD of Logged Detects	1.499

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.767	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.286	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.402	KM Standard Error of Mean	0.61
KM SD	1.906	95% KM (BCA) UCL	2.484
95% KM (t) UCL	2.507	95% KM (Percentile Bootstrap) UCL	2.404
95% KM (z) UCL	2.405	95% KM Bootstrap t UCL	4.133
90% KM Chebyshev UCL	3.231	95% KM Chebyshev UCL	4.059
97.5% KM Chebyshev UCL	5.208	99% KM Chebyshev UCL	7.467

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.368	Anderson-Darling GOF Test	
5% A-D Critical Value	0.753	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.197	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.29	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.733	k star (bias corrected MLE)	0.563
Theta hat (MLE)	2.3	Theta star (bias corrected MLE)	2.995
nu hat (MLE)	13.2	nu star (bias corrected)	10.13
Mean (detects)	1.686		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.381
Maximum	6.56	Median	0.881
SD	2.014	CV	1.458
k hat (MLE)	0.459	k star (bias corrected MLE)	0.394
Theta hat (MLE)	3.01	Theta star (bias corrected MLE)	3.503
nu hat (MLE)	10.09	nu star (bias corrected)	8.675
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (8.68, α)	3.132	Adjusted Chi Square Value (8.68, β)	2.614
95% Gamma Approximate UCL (use when n>=50)	3.826	95% Gamma Adjusted UCL (use when n<50)	4.585

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.402	SD (KM)	1.906
Variance (KM)	3.633	SE of Mean (KM)	0.61
k hat (KM)	0.541	k star (KM)	0.454
nu hat (KM)	11.9	nu star (KM)	9.99
theta hat (KM)	2.591	theta star (KM)	3.087
80% gamma percentile (KM)	2.29	90% gamma percentile (KM)	3.867

On-Project Blue Beach Area Groundwater

95% gamma percentile (KM)	5.573	99% gamma percentile (KM)	9.805

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.99, α)	3.936	Adjusted Chi Square Value (9.99, β)	3.34
95% Gamma Approximate KM-UCL (use when n>=50)	3.559	95% Gamma Adjusted KM-UCL (use when n<50)	4.194

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.904	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.212	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.408	Mean in Log Scale	-0.595
SD in Original Scale	1.995	SD in Log Scale	1.509
95% t UCL (assumes normality of ROS data)	2.498	95% Percentile Bootstrap UCL	2.428
95% BCA Bootstrap UCL	2.79	95% Bootstrap t UCL	4.071
95% H-UCL (Log ROS)	11.92		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.624	KM Geo Mean	0.536
KM SD (logged)	1.455	95% Critical H Value (KM-Log)	3.935
KM Standard Error of Mean (logged)	0.466	95% H-UCL (KM -Log)	9.45
KM SD (logged)	1.455	95% Critical H Value (KM-Log)	3.935
KM Standard Error of Mean (logged)	0.466		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.407	Mean in Log Scale	-0.588
SD in Original Scale	1.996	SD in Log Scale	1.489
95% t UCL (Assumes normality)	2.497	95% H-Stat UCL	11.1

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL	4.133	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	4.194

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Groundwater

RA_WG_Metals|Iron|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	9
		Number of Missing Observations	11
Number of Detects	8	Number of Non-Detects	3
Number of Distinct Detects	8	Number of Distinct Non-Detects	1
Minimum Detect	61	Minimum Non-Detect	60
Maximum Detect	68200	Maximum Non-Detect	60
Variance Detects	8.019E+8	Percent Non-Detects	27.27%
Mean Detects	17362	SD Detects	28317
Median Detects	3321	CV Detects	1.631
Skewness Detects	1.448	Kurtosis Detects	0.233
Mean of Logged Detects	7.325	SD of Logged Detects	2.965

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.658	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.4	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	12643	KM Standard Error of Mean	7693
KM SD	23868	95% KM (BCA) UCL	24585
95% KM (t) UCL	26587	95% KM (Percentile Bootstrap) UCL	25069
95% KM (z) UCL	25298	95% KM Bootstrap t UCL	122414
90% KM Chebyshev UCL	35723	95% KM Chebyshev UCL	46177
97.5% KM Chebyshev UCL	60688	99% KM Chebyshev UCL	89190

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.554	Anderson-Darling GOF Test	
5% A-D Critical Value	0.803	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.208	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.318	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.285	k star (bias corrected MLE)	0.262
Theta hat (MLE)	60856	Theta star (bias corrected MLE)	66358
nu hat (MLE)	4.565	nu star (bias corrected)	4.186
Mean (detects)	17362		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	12627
Maximum	68200	Median	80
SD	25042	CV	1.983
k hat (MLE)	0.144	k star (bias corrected MLE)	0.165
Theta hat (MLE)	87734	Theta star (bias corrected MLE)	76398
nu hat (MLE)	3.166	nu star (bias corrected)	3.636
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (3.64, α)	0.583	Adjusted Chi Square Value (3.64, β)	0.421
95% Gamma Approximate UCL (use when n>=50)	78692	95% Gamma Adjusted UCL (use when n<50)	109160

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	12643	SD (KM)	23868
Variance (KM)	5.697E+8	SE of Mean (KM)	7693
k hat (KM)	0.281	k star (KM)	0.265
nu hat (KM)	6.173	nu star (KM)	5.823
theta hat (KM)	45056	theta star (KM)	47767
80% gamma percentile (KM)	18719	90% gamma percentile (KM)	37779

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95% gamma percentile (KM)	60154	99% gamma percentile (KM)	119252

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.82, α)	1.55	Adjusted Chi Square Value (5.82, β)	1.22
95% Gamma Approximate KM-UCL (use when n>=50)	47494	95% Gamma Adjusted KM-UCL (use when n<50)	60325

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.864	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.215	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	12628	Mean in Log Scale	5.319
SD in Original Scale	25041	SD in Log Scale	4.296
95% t UCL (assumes normality of ROS data)	26312	95% Percentile Bootstrap UCL	25064
95% BCA Bootstrap UCL	29222	95% Bootstrap t UCL	127101
95% H-UCL (Log ROS)	3.642E+12		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	6.444	KM Geo Mean	628.9
KM SD (logged)	2.768	95% Critical H Value (KM-Log)	6.941
KM Standard Error of Mean (logged)	0.892	95% H-UCL (KM -Log)	12642178
KM SD (logged)	2.768	95% Critical H Value (KM-Log)	6.941
KM Standard Error of Mean (logged)	0.892		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	12635	Mean in Log Scale	6.255
SD in Original Scale	25037	SD in Log Scale	3.084
95% t UCL (Assumes normality)	26317	95% H-Stat UCL	1.092E+8

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL	122414	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	60325

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Groundwater

RA_WG_Metals|Lead|ug/l

General Statistics

Total Number of Observations	40	Number of Distinct Observations	20
		Number of Missing Observations	3
Number of Detects	20	Number of Non-Detects	20
Number of Distinct Detects	18	Number of Distinct Non-Detects	2
Minimum Detect	0.081	Minimum Non-Detect	0.5
Maximum Detect	275	Maximum Non-Detect	1
Variance Detects	6644	Percent Non-Detects	50%
Mean Detects	37.96	SD Detects	81.51
Median Detects	2.6	CV Detects	2.147
Skewness Detects	2.249	Kurtosis Detects	4.068
Mean of Logged Detects	1.17	SD of Logged Detects	2.321

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.53	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.452	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	19.12	KM Standard Error of Mean	9.613
KM SD	59.26	95% KM (BCA) UCL	36.99
95% KM (t) UCL	35.31	95% KM (Percentile Bootstrap) UCL	35.16
95% KM (z) UCL	34.93	95% KM Bootstrap t UCL	56.98
90% KM Chebyshev UCL	47.95	95% KM Chebyshev UCL	61.02
97.5% KM Chebyshev UCL	79.15	99% KM Chebyshev UCL	114.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.075	Anderson-Darling GOF Test	
5% A-D Critical Value	0.853	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.339	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.211	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.282	k star (bias corrected MLE)	0.273
Theta hat (MLE)	134.5	Theta star (bias corrected MLE)	138.9
nu hat (MLE)	11.29	nu star (bias corrected)	10.93
Mean (detects)	37.96		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	18.99
Maximum	275	Median	0.0455
SD	60.05	CV	3.163
k hat (MLE)	0.163	k star (bias corrected MLE)	0.167
Theta hat (MLE)	116.6	Theta star (bias corrected MLE)	113.5
nu hat (MLE)	13.03	nu star (bias corrected)	13.39
Adjusted Level of Significance (β)	0.044		
Approximate Chi Square Value (13.39, α)	6.154	Adjusted Chi Square Value (13.39, β)	5.97
95% Gamma Approximate UCL (use when n>=50)	41.3	95% Gamma Adjusted UCL (use when n<50)	42.58

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	19.12	SD (KM)	59.26
Variance (KM)	3511	SE of Mean (KM)	9.613
k hat (KM)	0.104	k star (KM)	0.113
nu hat (KM)	8.325	nu star (KM)	9.034
theta hat (KM)	183.7	theta star (KM)	169.3
80% gamma percentile (KM)	15.6	90% gamma percentile (KM)	53.19

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95% gamma percentile (KM)	109.8	99% gamma percentile (KM)	285.5

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.03, α)	3.347	Adjusted Chi Square Value (9.03, β)	3.218
95% Gamma Approximate KM-UCL (use when n>=50)	51.59	95% Gamma Adjusted KM-UCL (use when n<50)	53.66

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.916	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.189	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	19.12	Mean in Log Scale	-0.518
SD in Original Scale	60.01	SD in Log Scale	2.596
95% t UCL (assumes normality of ROS data)	35.11	95% Percentile Bootstrap UCL	35.64
95% BCA Bootstrap UCL	40.88	95% Bootstrap t UCL	56.6
95% H-UCL (Log ROS)	121.5		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.217	KM Geo Mean	0.805
KM SD (logged)	2.178	95% Critical H Value (KM-Log)	4.043
KM Standard Error of Mean (logged)	0.384	95% H-UCL (KM -Log)	35.33
KM SD (logged)	2.178	95% Critical H Value (KM-Log)	4.043
KM Standard Error of Mean (logged)	0.384		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	19.19	Mean in Log Scale	0.117
SD in Original Scale	59.99	SD in Log Scale	1.954
95% t UCL (Assumes normality)	35.17	95% H-Stat UCL	24.17

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	79.15

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Groundwater

RA_WG_Metals|Manganese|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
		Number of Missing Observations	11
Minimum	1.4	Mean	847
Maximum	3180	Median	38
SD	1139	Std. Error of Mean	343.6
Coefficient of Variation	1.345	Skewness	1.102

Normal GOF Test

Shapiro Wilk Test Statistic	0.782	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.307	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1470	95% Adjusted-CLT UCL (Chen-1995)	1534
		95% Modified-t UCL (Johnson-1978)	1489

Gamma GOF Test

A-D Test Statistic	0.886	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.832	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.267	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.278	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.271	k star (bias corrected MLE)	0.258
Theta hat (MLE)	3124	Theta star (bias corrected MLE)	3285
nu hat (MLE)	5.965	nu star (bias corrected)	5.672
MLE Mean (bias corrected)	847	MLE Sd (bias corrected)	1668
		Approximate Chi Square Value (0.05)	1.474
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	1.156

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	3258	95% Adjusted Gamma UCL (use when n<50)	4157

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.819	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.85	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.25	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.336	Mean of logged Data	4.156
Maximum of Logged Data	8.065	SD of logged Data	3.226

Assuming Lognormal Distribution

95% H-UCL	41721897	90% Chebyshev (MVUE) UCL	9194
95% Chebyshev (MVUE) UCL	12211	97.5% Chebyshev (MVUE) UCL	16398
99% Chebyshev (MVUE) UCL	24623		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1412	95% Jackknife UCL	1470
95% Standard Bootstrap UCL	1391	95% Bootstrap-t UCL	1659
95% Hall's Bootstrap UCL	1463	95% Percentile Bootstrap UCL	1383
95% BCA Bootstrap UCL	1518		
90% Chebyshev(Mean, Sd) UCL	1878	95% Chebyshev(Mean, Sd) UCL	2345
97.5% Chebyshev(Mean, Sd) UCL	2993	99% Chebyshev(Mean, Sd) UCL	4265

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Suggested UCL to Use
95% Adjusted Gamma UCL 4157

Recommended UCL exceeds the maximum observation

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Groundwater

RA_WG_SVOCs-SIM|1-Methylnaphthalene|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	7
		Number of Missing Observations	11
Number of Detects	3	Number of Non-Detects	8
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.38	Minimum Non-Detect	0.093
Maximum Detect	90	Maximum Non-Detect	0.098
Variance Detects	2285	Percent Non-Detects	72.73%
Mean Detects	54.79	SD Detects	47.8
Median Detects	74	CV Detects	0.872
Skewness Detects	-1.516	Kurtosis Detects	N/A
Mean of Logged Detects	2.612	SD of Logged Detects	3.102

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.879	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.323	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	15.01	KM Standard Error of Mean	11.73
KM SD	31.76	95% KM (BCA) UCL	N/A
95% KM (t) UCL	36.27	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	34.3	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	50.2	95% KM Chebyshev UCL	66.14
97.5% KM Chebyshev UCL	88.26	99% KM Chebyshev UCL	131.7

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.462	k star (bias corrected MLE)	N/A
Theta hat (MLE)	118.6	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.773	nu star (bias corrected)	N/A
Mean (detects)	54.79		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	14.95
Maximum	90	Median	0.01
SD	33.34	CV	2.23
k hat (MLE)	0.145	k star (bias corrected MLE)	0.166
Theta hat (MLE)	103.4	Theta star (bias corrected MLE)	90.17
nu hat (MLE)	3.182	nu star (bias corrected)	3.648
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (3.65, α)	0.588	Adjusted Chi Square Value (3.65, β)	0.424
95% Gamma Approximate UCL (use when n>=50)	92.8	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	15.01	SD (KM)	31.76
Variance (KM)	1009	SE of Mean (KM)	11.73
k hat (KM)	0.223	k star (KM)	0.223
nu hat (KM)	4.914	nu star (KM)	4.907
theta hat (KM)	67.21	theta star (KM)	67.3
80% gamma percentile (KM)	20.84	90% gamma percentile (KM)	45.33

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95% gamma percentile (KM)	75.1	99% gamma percentile (KM)	155.7

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.91, α)	1.109	Adjusted Chi Square Value (4.91, β)	0.847
95% Gamma Approximate KM-UCL (use when n>=50)	66.39	95% Gamma Adjusted KM-UCL (use when n<50)	86.96

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.777	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.374	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	14.94	Mean in Log Scale	-5.813
SD in Original Scale	33.35	SD in Log Scale	6.073
95% t UCL (assumes normality of ROS data)	33.17	95% Percentile Bootstrap UCL	31.31
95% BCA Bootstrap UCL	38	95% Bootstrap t UCL	4362
95% H-UCL (Log ROS)	7.650E+17		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.015	KM Geo Mean	0.362
KM SD (logged)	2.585	95% Critical H Value (KM-Log)	6.511
KM Standard Error of Mean (logged)	0.955	95% H-UCL (KM -Log)	2098
KM SD (logged)	2.585	95% Critical H Value (KM-Log)	6.511
KM Standard Error of Mean (logged)	0.955		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	14.98	Mean in Log Scale	-1.507
SD in Original Scale	33.33	SD in Log Scale	2.987
95% t UCL (Assumes normality)	33.19	95% H-Stat UCL	22002

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	36.27

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Groundwater

RA_WG_SVOCs-SIM|2-Methylnaphthalene|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	6
		Number of Missing Observations	11
Number of Detects	2	Number of Non-Detects	9
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	31.5	Minimum Non-Detect	0.093
Maximum Detect	85	Maximum Non-Detect	0.098
Variance Detects	1431	Percent Non-Detects	81.82%
Mean Detects	58.25	SD Detects	37.83
Median Detects	58.25	CV Detects	0.649
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	3.946	SD of Logged Detects	0.702

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	10.67	KM Standard Error of Mean	10.73
KM SD	25.16	95% KM (BCA) UCL	N/A
95% KM (t) UCL	30.11	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	28.32	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	42.86	95% KM Chebyshev UCL	57.44
97.5% KM Chebyshev UCL	77.68	99% KM Chebyshev UCL	117.4

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	4.382	k star (bias corrected MLE)	N/A
Theta hat (MLE)	13.29	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	17.53	nu star (bias corrected)	N/A
Mean (detects)	58.25		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	10.67	SD (KM)	25.16
Variance (KM)	633.2	SE of Mean (KM)	10.73
k hat (KM)	0.18	k star (KM)	0.191
nu hat (KM)	3.953	nu star (KM)	4.208
theta hat (KM)	59.36	theta star (KM)	55.76
80% gamma percentile (KM)	13.72	90% gamma percentile (KM)	32.24
95% gamma percentile (KM)	55.59	99% gamma percentile (KM)	120.4

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0278
Approximate Chi Square Value (4.21, α)	0.806	Adjusted Chi Square Value (4.21, β)	0.597
95% Gamma Approximate KM-UCL (use when n>=50)	55.72	95% Gamma Adjusted KM-UCL (use when n<50)	75.17

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	11.64	Mean in Log Scale	0.513
SD in Original Scale	25.99	SD in Log Scale	1.988
95% t UCL (assumes normality of ROS data)	25.84	95% Percentile Bootstrap UCL	25.5
95% BCA Bootstrap UCL	34.32	95% Bootstrap t UCL	246.3
95% H-UCL (Log ROS)	302.5		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.226	KM Geo Mean	0.294
KM SD (logged)	2.447	95% Critical H Value (KM-Log)	6.189

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KM Standard Error of Mean (logged)	1.044	95% H-UCL (KM -Log)	705
KM SD (logged)	2.447	95% Critical H Value (KM-Log)	6.189
KM Standard Error of Mean (logged)	1.044		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	10.63	Mean in Log Scale	-1.779
SD in Original Scale	26.41	SD in Log Scale	2.84
95% t UCL (Assumes normality)	25.06	95% H-Stat UCL	5633

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	57.44

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_SVOCs-SIM|Benzo(a)anthracene|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	8
		Number of Missing Observations	11
Number of Detects	5	Number of Non-Detects	6
Number of Distinct Detects	5	Number of Distinct Non-Detects	4
Minimum Detect	0.051	Minimum Non-Detect	0.093
Maximum Detect	0.26	Maximum Non-Detect	0.098
Variance Detects	0.0105	Percent Non-Detects	54.55%
Mean Detects	0.14	SD Detects	0.102
Median Detects	0.096	CV Detects	0.733
Skewness Detects	0.496	Kurtosis Detects	-3.07
Mean of Logged Detects	-2.21	SD of Logged Detects	0.794

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.808	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.265	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0921	KM Standard Error of Mean	0.0256
KM SD	0.0757	95% KM (BCA) UCL	0.149
95% KM (t) UCL	0.138	95% KM (Percentile Bootstrap) UCL	0.141
95% KM (z) UCL	0.134	95% KM Bootstrap t UCL	0.221
90% KM Chebyshev UCL	0.169	95% KM Chebyshev UCL	0.204
97.5% KM Chebyshev UCL	0.252	99% KM Chebyshev UCL	0.347

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.524	Anderson-Darling GOF Test	
5% A-D Critical Value	0.684	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.264	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.36	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.214	k star (bias corrected MLE)	1.019
Theta hat (MLE)	0.0631	Theta star (bias corrected MLE)	0.137
nu hat (MLE)	22.14	nu star (bias corrected)	10.19
Mean (detects)	0.14		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0113	Mean	0.0892
Maximum	0.26	Median	0.052
SD	0.0825	CV	0.925
k hat (MLE)	1.645	k star (bias corrected MLE)	1.257
Theta hat (MLE)	0.0542	Theta star (bias corrected MLE)	0.0709
nu hat (MLE)	36.18	nu star (bias corrected)	27.65
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (27.65, α)	16.66	Adjusted Chi Square Value (27.65, β)	15.28
95% Gamma Approximate UCL (use when n>=50)	0.148	95% Gamma Adjusted UCL (use when n<50)	0.161

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0921	SD (KM)	0.0757
Variance (KM)	0.00573	SE of Mean (KM)	0.0256
k hat (KM)	1.481	k star (KM)	1.138
nu hat (KM)	32.58	nu star (KM)	25.03
theta hat (KM)	0.0622	theta star (KM)	0.081
80% gamma percentile (KM)	0.147	90% gamma percentile (KM)	0.206

On-Project Blue Beach Area Groundwater

95% gamma percentile (KM)	0.264	99% gamma percentile (KM)	0.398

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (25.03, α)	14.63	Adjusted Chi Square Value (25.03, β)	13.35
95% Gamma Approximate KM-UCL (use when n>=50)	0.158	95% Gamma Adjusted KM-UCL (use when n<50)	0.173

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.836	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.238	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0933	Mean in Log Scale	-2.607
SD in Original Scale	0.0792	SD in Log Scale	0.657
95% t UCL (assumes normality of ROS data)	0.137	95% Percentile Bootstrap UCL	0.132
95% BCA Bootstrap UCL	0.149	95% Bootstrap t UCL	0.259
95% H-UCL (Log ROS)	0.151		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.615	KM Geo Mean	0.0731
KM SD (logged)	0.609	95% Critical H Value (KM-Log)	2.326
KM Standard Error of Mean (logged)	0.206	95% H-UCL (KM -Log)	0.138
KM SD (logged)	0.609	95% Critical H Value (KM-Log)	2.326
KM Standard Error of Mean (logged)	0.206		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0894	Mean in Log Scale	-2.668
SD in Original Scale	0.0808	SD in Log Scale	0.666
95% t UCL (Assumes normality)	0.134	95% H-Stat UCL	0.144

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.138

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_SVOCs-SIM|Benzo(a)Pyrene|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	6
		Number of Missing Observations	11
Number of Detects	4	Number of Non-Detects	7
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.0745	Minimum Non-Detect	0.093
Maximum Detect	0.22	Maximum Non-Detect	0.098
Variance Detects	0.00625	Percent Non-Detects	63.64%
Mean Detects	0.152	SD Detects	0.079
Median Detects	0.157	CV Detects	0.52
Skewness Detects	-0.0472	Kurtosis Detects	-5.728
Mean of Logged Detects	-2	SD of Logged Detects	0.568

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.785	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.306	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.106	KM Standard Error of Mean	0.0193
KM SD	0.0543	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.141	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.138	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.164	95% KM Chebyshev UCL	0.19
97.5% KM Chebyshev UCL	0.227	99% KM Chebyshev UCL	0.298

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.567	Anderson-Darling GOF Test	
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.339	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	4.493	k star (bias corrected MLE)	1.29
Theta hat (MLE)	0.0338	Theta star (bias corrected MLE)	0.118
nu hat (MLE)	35.94	nu star (bias corrected)	10.32
Mean (detects)	0.152		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0481	Mean	0.105
Maximum	0.22	Median	0.0814
SD	0.0601	CV	0.571
k hat (MLE)	4.258	k star (bias corrected MLE)	3.157
Theta hat (MLE)	0.0247	Theta star (bias corrected MLE)	0.0333
nu hat (MLE)	93.67	nu star (bias corrected)	69.46
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (69.46, α)	51.27	Adjusted Chi Square Value (69.46, β)	48.73
95% Gamma Approximate UCL (use when n>=50)	0.143	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.106	SD (KM)	0.0543
Variance (KM)	0.00295	SE of Mean (KM)	0.0193
k hat (KM)	3.809	k star (KM)	2.83
nu hat (KM)	83.79	nu star (KM)	62.27
theta hat (KM)	0.0278	theta star (KM)	0.0375
80% gamma percentile (KM)	0.152	90% gamma percentile (KM)	0.19

On-Project Blue Beach Area Groundwater

95% gamma percentile (KM)	0.226	99% gamma percentile (KM)	0.304

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (62.27, α)	45.12	Adjusted Chi Square Value (62.27, β)	42.75
95% Gamma Approximate KM-UCL (use when n>=50)	0.146	95% Gamma Adjusted KM-UCL (use when n<50)	0.154

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.815	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.304	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.107	Mean in Log Scale	-2.337
SD in Original Scale	0.0579	SD in Log Scale	0.447
95% t UCL (assumes normality of ROS data)	0.139	95% Percentile Bootstrap UCL	0.136
95% BCA Bootstrap UCL	0.146	95% Bootstrap t UCL	0.202
95% H-UCL (Log ROS)	0.144		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.34	KM Geo Mean	0.0964
KM SD (logged)	0.4	95% Critical H Value (KM-Log)	2.055
KM Standard Error of Mean (logged)	0.147	95% H-UCL (KM -Log)	0.135
KM SD (logged)	0.4	95% Critical H Value (KM-Log)	2.055
KM Standard Error of Mean (logged)	0.147		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0855	Mean in Log Scale	-2.666
SD in Original Scale	0.0682	SD in Log Scale	0.613
95% t UCL (Assumes normality)	0.123	95% H-Stat UCL	0.132

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.141

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_SVOCs-SIM|Benzo(b)fluoranthene|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	7
		Number of Missing Observations	11
Number of Detects	4	Number of Non-Detects	7
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.095	Minimum Non-Detect	0.093
Maximum Detect	0.38	Maximum Non-Detect	0.098
Variance Detects	0.0135	Percent Non-Detects	63.64%
Mean Detects	0.239	SD Detects	0.116
Median Detects	0.24	CV Detects	0.487
Skewness Detects	-0.0644	Kurtosis Detects	1.502
Mean of Logged Detects	-1.544	SD of Logged Detects	0.582

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.944	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.254	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.146	KM Standard Error of Mean	0.0323
KM SD	0.0927	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.205	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.199	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.243	95% KM Chebyshev UCL	0.287
97.5% KM Chebyshev UCL	0.348	99% KM Chebyshev UCL	0.467

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.376	Anderson-Darling GOF Test	
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.316	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	4.641	k star (bias corrected MLE)	1.327
Theta hat (MLE)	0.0514	Theta star (bias corrected MLE)	0.18
nu hat (MLE)	37.13	nu star (bias corrected)	10.62
Mean (detects)	0.239		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0932
Maximum	0.38	Median	0.01
SD	0.132	CV	1.415
k hat (MLE)	0.558	k star (bias corrected MLE)	0.467
Theta hat (MLE)	0.167	Theta star (bias corrected MLE)	0.2
nu hat (MLE)	12.28	nu star (bias corrected)	10.27
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (10.27, α)	4.108	Adjusted Chi Square Value (10.27, β)	3.496
95% Gamma Approximate UCL (use when n>=50)	0.233	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.146	SD (KM)	0.0927
Variance (KM)	0.0086	SE of Mean (KM)	0.0323
k hat (KM)	2.48	k star (KM)	1.864
nu hat (KM)	54.56	nu star (KM)	41.01
theta hat (KM)	0.0589	theta star (KM)	0.0783
80% gamma percentile (KM)	0.22	90% gamma percentile (KM)	0.289

On-Project Blue Beach Area Groundwater

95% gamma percentile (KM)	0.354	99% gamma percentile (KM)	0.5

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (41.01, α)	27.34	Adjusted Chi Square Value (41.01, β)	25.53
95% Gamma Approximate KM-UCL (use when n>=50)	0.219	95% Gamma Adjusted KM-UCL (use when n<50)	0.235

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.894	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.33	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.111	Mean in Log Scale	-2.679
SD in Original Scale	0.12	SD in Log Scale	1.005
95% t UCL (assumes normality of ROS data)	0.177	95% Percentile Bootstrap UCL	0.172
95% BCA Bootstrap UCL	0.183	95% Bootstrap t UCL	0.215
95% H-UCL (Log ROS)	0.296		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.072	KM Geo Mean	0.126
KM SD (logged)	0.502	95% Critical H Value (KM-Log)	2.178
KM Standard Error of Mean (logged)	0.175	95% H-UCL (KM -Log)	0.202
KM SD (logged)	0.502	95% Critical H Value (KM-Log)	2.178
KM Standard Error of Mean (logged)	0.175		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.117	Mean in Log Scale	-2.503
SD in Original Scale	0.116	SD in Log Scale	0.825
95% t UCL (Assumes normality)	0.18	95% H-Stat UCL	0.231

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.205

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Groundwater

RA_WG_SVOCs-SIM|Naphthalene|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	7
		Number of Missing Observations	11
Number of Detects	3	Number of Non-Detects	8
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.092	Minimum Non-Detect	0.093
Maximum Detect	250	Maximum Non-Detect	0.098
Variance Detects	16021	Percent Non-Detects	72.73%
Mean Detects	136.7	SD Detects	126.6
Median Detects	160	CV Detects	0.926
Skewness Detects	-0.8	Kurtosis Detects	N/A
Mean of Logged Detects	2.737	SD of Logged Detects	4.442

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.975	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.24	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	37.35	KM Standard Error of Mean	30.03
KM SD	81.33	95% KM (BCA) UCL	N/A
95% KM (t) UCL	91.78	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	86.75	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	127.4	95% KM Chebyshev UCL	168.3
97.5% KM Chebyshev UCL	224.9	99% KM Chebyshev UCL	336.2

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.314	k star (bias corrected MLE)	N/A
Theta hat (MLE)	435.5	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	1.883	nu star (bias corrected)	N/A
Mean (detects)	136.7		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	43.08
Maximum	250	Median	2.022
SD	83.05	CV	1.928
k hat (MLE)	0.218	k star (bias corrected MLE)	0.219
Theta hat (MLE)	198	Theta star (bias corrected MLE)	196.9
nu hat (MLE)	4.786	nu star (bias corrected)	4.814
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (4.81, α)	1.067	Adjusted Chi Square Value (4.81, β)	0.812
95% Gamma Approximate UCL (use when n>=50)	194.3	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	37.35	SD (KM)	81.33
Variance (KM)	6614	SE of Mean (KM)	30.03
k hat (KM)	0.211	k star (KM)	0.214
nu hat (KM)	4.64	nu star (KM)	4.708
theta hat (KM)	177.1	theta star (KM)	174.5
80% gamma percentile (KM)	50.89	90% gamma percentile (KM)	112.9

On-Project Blue Beach Area Groundwater

95% gamma percentile (KM)	189	99% gamma percentile (KM)	396.3

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.71, α)	1.02	Adjusted Chi Square Value (4.71, β)	0.772
95% Gamma Approximate KM-UCL (use when n>=50)	172.4	95% Gamma Adjusted KM-UCL (use when n<50)	227.6

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.792	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.367	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	37.51	Mean in Log Scale	-0.931
SD in Original Scale	85.22	SD in Log Scale	3.463
95% t UCL (assumes normality of ROS data)	84.08	95% Percentile Bootstrap UCL	82.9
95% BCA Bootstrap UCL	97.35	95% Bootstrap t UCL	8459
95% H-UCL (Log ROS)	1914011		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.989	KM Geo Mean	0.372
KM SD (logged)	2.965	95% Critical H Value (KM-Log)	7.407
KM Standard Error of Mean (logged)	1.095	95% H-UCL (KM -Log)	31355
KM SD (logged)	2.965	95% Critical H Value (KM-Log)	7.407
KM Standard Error of Mean (logged)	1.095		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	37.32	Mean in Log Scale	-1.473
SD in Original Scale	85.31	SD in Log Scale	3.355
95% t UCL (Assumes normality)	83.94	95% H-Stat UCL	437242

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	91.78

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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RA_WG_VOCs_VPHs|1,1,2,2-Tetrachloroethane|ug/l

General Statistics			
Total Number of Observations	42	Number of Distinct Observations	4
		Number of Missing Observations	1
Number of Detects	1	Number of Non-Detects	41
Number of Distinct Detects	1	Number of Distinct Non-Detects	4

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable RA_WG_VOCs_VPHs|1,1,2,2-Tetrachloroethane|ug/l was not processed!

On-Project Blue Beach Area Groundwater

RA_WG_VOCs_VPHs|1,1,2-Trichloroethane|ug/l

General Statistics

Total Number of Observations	42	Number of Distinct Observations	5
		Number of Missing Observations	1
Number of Detects	2	Number of Non-Detects	40
Number of Distinct Detects	2	Number of Distinct Non-Detects	3
Minimum Detect	0.37	Minimum Non-Detect	0.25
Maximum Detect	0.4	Maximum Non-Detect	5
Variance Detects	4.5000E-4	Percent Non-Detects	95.24%
Mean Detects	0.385	SD Detects	0.0212
Median Detects	0.385	CV Detects	0.0551
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.955	SD of Logged Detects	0.0551

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.262	KM Standard Error of Mean	0.0118
KM SD	0.0391	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.282	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.282	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.298	95% KM Chebyshev UCL	0.314
97.5% KM Chebyshev UCL	0.336	99% KM Chebyshev UCL	0.379

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	658.4	k star (bias corrected MLE)	N/A
Theta hat (MLE)	5.8471E-4	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2634	nu star (bias corrected)	N/A
Mean (detects)	0.385		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.262	SD (KM)	0.0391
Variance (KM)	0.00153	SE of Mean (KM)	0.0118
k hat (KM)	45.06	k star (KM)	41.85
nu hat (KM)	3785	nu star (KM)	3516
theta hat (KM)	0.00582	theta star (KM)	0.00627
80% gamma percentile (KM)	0.296	90% gamma percentile (KM)	0.315
95% gamma percentile (KM)	0.332	99% gamma percentile (KM)	0.366

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0443
Approximate Chi Square Value (N/A, α)	3379	Adjusted Chi Square Value (N/A, β)	3374
95% Gamma Approximate KM-UCL (use when n>=50)	0.273	95% Gamma Adjusted KM-UCL (use when n<50)	0.273

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.262	Mean in Log Scale	-1.363
SD in Original Scale	0.0559	SD in Log Scale	0.211
95% t UCL (assumes normality of ROS data)	0.276	95% Percentile Bootstrap UCL	0.276
95% BCA Bootstrap UCL	0.277	95% Bootstrap t UCL	0.277
95% H-UCL (Log ROS)	0.277		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.347	KM Geo Mean	0.26
KM SD (logged)	0.124	95% Critical H Value (KM-Log)	1.695

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KM Standard Error of Mean (logged)	0.0375	95% H-UCL (KM -Log)	0.271
KM SD (logged)	0.124	95% Critical H Value (KM-Log)	1.695
KM Standard Error of Mean (logged)	0.0375		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.25	Mean in Log Scale	-1.641
SD in Original Scale	0.363	SD in Log Scale	0.553
95% t UCL (Assumes normality)	0.345	95% H-Stat UCL	0.267

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.282	KM H-UCL	0.271
95% KM (BCA) UCL	N/A		

Warning: One or more Recommended UCL(s) not available!

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_VOCs_VPHs|1,1-Dichloroethane|ug/l

General Statistics

Total Number of Observations	42	Number of Distinct Observations	8
		Number of Missing Observations	1
Number of Detects	5	Number of Non-Detects	37
Number of Distinct Detects	5	Number of Distinct Non-Detects	3
Minimum Detect	0.12	Minimum Non-Detect	0.25
Maximum Detect	3.2	Maximum Non-Detect	5
Variance Detects	1.806	Percent Non-Detects	88.1%
Mean Detects	0.8	SD Detects	1.344
Median Detects	0.26	CV Detects	1.68
Skewness Detects	2.218	Kurtosis Detects	4.936
Mean of Logged Detects	-1.116	SD of Logged Detects	1.335

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.602	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.448	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.215	KM Standard Error of Mean	0.0832
KM SD	0.474	95% KM (BCA) UCL	0.474
95% KM (t) UCL	0.355	95% KM (Percentile Bootstrap) UCL	0.394
95% KM (z) UCL	0.352	95% KM Bootstrap t UCL	0.97
90% KM Chebyshev UCL	0.464	95% KM Chebyshev UCL	0.577
97.5% KM Chebyshev UCL	0.734	99% KM Chebyshev UCL	1.043

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.829	Anderson-Darling GOF Test	
5% A-D Critical Value	0.702	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.413	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.368	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.679	k star (bias corrected MLE)	0.405
Theta hat (MLE)	1.178	Theta star (bias corrected MLE)	1.975
nu hat (MLE)	6.794	nu star (bias corrected)	4.051
Mean (detects)	0.8		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.193
Maximum	3.2	Median	0.01
SD	0.524	CV	2.71
k hat (MLE)	0.376	k star (bias corrected MLE)	0.365
Theta hat (MLE)	0.514	Theta star (bias corrected MLE)	0.529
nu hat (MLE)	31.62	nu star (bias corrected)	30.7
Adjusted Level of Significance (β)	0.0443		
Approximate Chi Square Value (30.70, α)	19.04	Adjusted Chi Square Value (30.70, β)	18.72
95% Gamma Approximate UCL (use when n>=50)	0.312	95% Gamma Adjusted UCL (use when n<50)	0.317

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.215	SD (KM)	0.474
Variance (KM)	0.225	SE of Mean (KM)	0.0832
k hat (KM)	0.205	k star (KM)	0.206
nu hat (KM)	17.21	nu star (KM)	17.32
theta hat (KM)	1.048	theta star (KM)	1.041
80% gamma percentile (KM)	0.287	90% gamma percentile (KM)	0.649

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95% gamma percentile (KM)	1.097	99% gamma percentile (KM)	2.325

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (17.32, α)	8.898	Adjusted Chi Square Value (17.32, β)	8.683
95% Gamma Approximate KM-UCL (use when n>=50)	0.418	95% Gamma Adjusted KM-UCL (use when n<50)	0.428

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.792	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.336	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.226	Mean in Log Scale	-2.063
SD in Original Scale	0.483	SD in Log Scale	0.913
95% t UCL (assumes normality of ROS data)	0.351	95% Percentile Bootstrap UCL	0.369
95% BCA Bootstrap UCL	0.473	95% Bootstrap t UCL	0.695
95% H-UCL (Log ROS)	0.266		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.924	KM Geo Mean	0.146
KM SD (logged)	0.543	95% Critical H Value (KM-Log)	1.929
KM Standard Error of Mean (logged)	0.107	95% H-UCL (KM -Log)	0.199
KM SD (logged)	0.543	95% Critical H Value (KM-Log)	1.929
KM Standard Error of Mean (logged)	0.107		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.321	Mean in Log Scale	-1.563
SD in Original Scale	0.581	SD in Log Scale	0.684
95% t UCL (Assumes normality)	0.472	95% H-Stat UCL	0.329

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.199

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_VOCs_VPHs|1,2,4-Trimethylbenzene|ug/l

General Statistics

Total Number of Observations	42	Number of Distinct Observations	11
		Number of Missing Observations	1
Number of Detects	8	Number of Non-Detects	34
Number of Distinct Detects	7	Number of Distinct Non-Detects	4
Minimum Detect	0.08	Minimum Non-Detect	0.2
Maximum Detect	320	Maximum Non-Detect	2
Variance Detects	12589	Percent Non-Detects	80.95%
Mean Detects	42.52	SD Detects	112.2
Median Detects	0.3	CV Detects	2.639
Skewness Detects	2.82	Kurtosis Detects	7.965
Mean of Logged Detects	0.251	SD of Logged Detects	2.875

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.447	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.486	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	8.192	KM Standard Error of Mean	8.04
KM SD	48.74	95% KM (BCA) UCL	23.42
95% KM (t) UCL	21.72	95% KM (Percentile Bootstrap) UCL	23.3
95% KM (z) UCL	21.42	95% KM Bootstrap t UCL	320.4
90% KM Chebyshev UCL	32.31	95% KM Chebyshev UCL	43.24
97.5% KM Chebyshev UCL	58.4	99% KM Chebyshev UCL	88.19

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.101	Anderson-Darling GOF Test	
5% A-D Critical Value	0.832	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.345	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.323	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.209	k star (bias corrected MLE)	0.214
Theta hat (MLE)	203.5	Theta star (bias corrected MLE)	198.8
nu hat (MLE)	3.343	nu star (bias corrected)	3.422
Mean (detects)	42.52		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	8.108
Maximum	320	Median	0.01
SD	49.34	CV	6.086
k hat (MLE)	0.135	k star (bias corrected MLE)	0.141
Theta hat (MLE)	60	Theta star (bias corrected MLE)	57.36
nu hat (MLE)	11.35	nu star (bias corrected)	11.87
Adjusted Level of Significance (β)	0.0443		
Approximate Chi Square Value (11.87, α)	5.144	Adjusted Chi Square Value (11.87, β)	4.986
95% Gamma Approximate UCL (use when n>=50)	18.71	95% Gamma Adjusted UCL (use when n<50)	19.31

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	8.192	SD (KM)	48.74
Variance (KM)	2375	SE of Mean (KM)	8.04
k hat (KM)	0.0283	k star (KM)	0.0421
nu hat (KM)	2.373	nu star (KM)	3.537
theta hat (KM)	290	theta star (KM)	194.6
80% gamma percentile (KM)	0.566	90% gamma percentile (KM)	9.705

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95% gamma percentile (KM)	40.42	99% gamma percentile (KM)	190.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.54, α)	0.548	Adjusted Chi Square Value (3.54, β)	0.51
95% Gamma Approximate KM-UCL (use when n>=50)	52.89	95% Gamma Adjusted KM-UCL (use when n<50)	56.76

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.847	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.319	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data Not Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	8.211	Mean in Log Scale	-2.479
SD in Original Scale	49.33	SD in Log Scale	2.383
95% t UCL (assumes normality of ROS data)	21.02	95% Percentile Bootstrap UCL	23.4
95% BCA Bootstrap UCL	31.31	95% Bootstrap t UCL	1624
95% H-UCL (Log ROS)	6.872		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.749	KM Geo Mean	0.174
KM SD (logged)	1.55	95% Critical H Value (KM-Log)	3.03
KM Standard Error of Mean (logged)	0.309	95% H-UCL (KM -Log)	1.203
KM SD (logged)	1.55	95% Critical H Value (KM-Log)	3.03
KM Standard Error of Mean (logged)	0.309		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	8.241	Mean in Log Scale	-1.491
SD in Original Scale	49.32	SD in Log Scale	1.525
95% t UCL (Assumes normality)	21.05	95% H-Stat UCL	1.469

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	58.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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RA_WG_VOCs_VPHs|1,2-Dichloropropane|ug/l

General Statistics			
Total Number of Observations	42	Number of Distinct Observations	4
		Number of Missing Observations	1
Number of Detects	1	Number of Non-Detects	41
Number of Distinct Detects	1	Number of Distinct Non-Detects	3

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable RA_WG_VOCs_VPHs|1,2-Dichloropropane|ug/l was not processed!

RA_WG_VOCs_VPHs|Chloroform|ug/l

General Statistics

Total Number of Observations	42	Number of Distinct Observations	7
		Number of Missing Observations	1
Number of Detects	4	Number of Non-Detects	38
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	0.1	Minimum Non-Detect	0.25
Maximum Detect	0.63	Maximum Non-Detect	5
Variance Detects	0.0614	Percent Non-Detects	90.48%
Mean Detects	0.263	SD Detects	0.248
Median Detects	0.16	CV Detects	0.944
Skewness Detects	1.867	Kurtosis Detects	3.527
Mean of Logged Detects	-1.616	SD of Logged Detects	0.813

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.76	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.365	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.152	KM Standard Error of Mean	0.0279
KM SD	0.0841	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.199	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.198	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.236	95% KM Chebyshev UCL	0.274
97.5% KM Chebyshev UCL	0.326	99% KM Chebyshev UCL	0.429

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.477	Anderson-Darling GOF Test	
5% A-D Critical Value	0.661	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.322	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.398	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.943	k star (bias corrected MLE)	0.652
Theta hat (MLE)	0.135	Theta star (bias corrected MLE)	0.402
nu hat (MLE)	15.54	nu star (bias corrected)	5.219
Mean (detects)	0.263		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.166
Maximum	0.63	Median	0.137
SD	0.126	CV	0.758
k hat (MLE)	1.688	k star (bias corrected MLE)	1.583
Theta hat (MLE)	0.0981	Theta star (bias corrected MLE)	0.105
nu hat (MLE)	141.8	nu star (bias corrected)	133
Adjusted Level of Significance (β)	0.0443		
Approximate Chi Square Value (132.99, α)	107.3	Adjusted Chi Square Value (132.99, β)	106.5
95% Gamma Approximate UCL (use when n>=50)	0.205	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.152	SD (KM)	0.0841
Variance (KM)	0.00708	SE of Mean (KM)	0.0279
k hat (KM)	3.262	k star (KM)	3.044
nu hat (KM)	274	nu star (KM)	255.7
theta hat (KM)	0.0466	theta star (KM)	0.0499
80% gamma percentile (KM)	0.216	90% gamma percentile (KM)	0.269

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95% gamma percentile (KM)	0.318	99% gamma percentile (KM)	0.423

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (255.74, α)	219.7	Adjusted Chi Square Value (255.74, β)	218.5
95% Gamma Approximate KM-UCL (use when n>=50)	0.177	95% Gamma Adjusted KM-UCL (use when n<50)	0.178

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.889	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.272	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.166	Mean in Log Scale	-1.953
SD in Original Scale	0.107	SD in Log Scale	0.559
95% t UCL (assumes normality of ROS data)	0.194	95% Percentile Bootstrap UCL	0.195
95% BCA Bootstrap UCL	0.2	95% Bootstrap t UCL	0.202
95% H-UCL (Log ROS)	0.197		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.964	KM Geo Mean	0.14
KM SD (logged)	0.352	95% Critical H Value (KM-Log)	1.804
KM Standard Error of Mean (logged)	0.177	95% H-UCL (KM -Log)	0.165
KM SD (logged)	0.352	95% Critical H Value (KM-Log)	1.804
KM Standard Error of Mean (logged)	0.177		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.254	Mean in Log Scale	-1.634
SD in Original Scale	0.367	SD in Log Scale	0.565
95% t UCL (Assumes normality)	0.349	95% H-Stat UCL	0.272

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.199

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_VOCs_VPHs|cis-1,2-Dichloroethene|ug/l

General Statistics

Total Number of Observations	42	Number of Distinct Observations	21
		Number of Missing Observations	1
Number of Detects	20	Number of Non-Detects	22
Number of Distinct Detects	19	Number of Distinct Non-Detects	2
Minimum Detect	0.13	Minimum Non-Detect	0.25
Maximum Detect	39.2	Maximum Non-Detect	0.5
Variance Detects	131.8	Percent Non-Detects	52.38%
Mean Detects	6.93	SD Detects	11.48
Median Detects	2.25	CV Detects	1.657
Skewness Detects	2.485	Kurtosis Detects	5.431
Mean of Logged Detects	0.888	SD of Logged Detects	1.551

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.583	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.281	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.392	KM Standard Error of Mean	1.334
KM SD	8.426	95% KM (BCA) UCL	5.728
95% KM (t) UCL	5.637	95% KM (Percentile Bootstrap) UCL	5.614
95% KM (z) UCL	5.586	95% KM Bootstrap t UCL	9.773
90% KM Chebyshev UCL	7.394	95% KM Chebyshev UCL	9.207
97.5% KM Chebyshev UCL	11.72	99% KM Chebyshev UCL	16.67

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.713	Anderson-Darling GOF Test	
5% A-D Critical Value	0.794	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.186	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.204	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.591	k star (bias corrected MLE)	0.536
Theta hat (MLE)	11.72	Theta star (bias corrected MLE)	12.93
nu hat (MLE)	23.65	nu star (bias corrected)	21.43
Mean (detects)	6.93		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.305
Maximum	39.2	Median	0.01
SD	8.562	CV	2.59
k hat (MLE)	0.227	k star (bias corrected MLE)	0.226
Theta hat (MLE)	14.59	Theta star (bias corrected MLE)	14.61
nu hat (MLE)	19.03	nu star (bias corrected)	19.01
Adjusted Level of Significance (β)	0.0443		
Approximate Chi Square Value (19.01, α)	10.12	Adjusted Chi Square Value (19.01, β)	9.89
95% Gamma Approximate UCL (use when n>=50)	6.206	95% Gamma Adjusted UCL (use when n<50)	6.352

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.392	SD (KM)	8.426
Variance (KM)	71	SE of Mean (KM)	1.334
k hat (KM)	0.162	k star (KM)	0.166
nu hat (KM)	13.61	nu star (KM)	13.97
theta hat (KM)	20.93	theta star (KM)	20.39
80% gamma percentile (KM)	3.995	90% gamma percentile (KM)	10.18

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95% gamma percentile (KM)	18.27	99% gamma percentile (KM)	41.29
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (13.97, α)	6.553	Adjusted Chi Square Value (13.97, β)	6.372
95% Gamma Approximate KM-UCL (use when n>=50)	7.233	95% Gamma Adjusted KM-UCL (use when n<50)	7.438
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.975	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0877	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	3.399	Mean in Log Scale	-0.731
SD in Original Scale	8.526	SD in Log Scale	2.072
95% t UCL (assumes normality of ROS data)	5.613	95% Percentile Bootstrap UCL	5.783
95% BCA Bootstrap UCL	6.461	95% Bootstrap t UCL	9.305
95% H-UCL (Log ROS)	13.88		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.511	KM Geo Mean	0.6
KM SD (logged)	1.706	95% Critical H Value (KM-Log)	3.241
KM Standard Error of Mean (logged)	0.284	95% H-UCL (KM -Log)	6.094
KM SD (logged)	1.706	95% Critical H Value (KM-Log)	3.241
KM Standard Error of Mean (logged)	0.284		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	3.404	Mean in Log Scale	-0.452
SD in Original Scale	8.523	SD in Log Scale	1.688
95% t UCL (Assumes normality)	5.617	95% H-Stat UCL	6.18
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Level			
Suggested UCL to Use			
Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	7.438		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_VOCs_VPHs|Ethylbenzene|ug/l

General Statistics

Total Number of Observations	42	Number of Distinct Observations	9
		Number of Missing Observations	1
Number of Detects	6	Number of Non-Detects	36
Number of Distinct Detects	6	Number of Distinct Non-Detects	4
Minimum Detect	0.08	Minimum Non-Detect	0.2
Maximum Detect	7.5	Maximum Non-Detect	2
Variance Detects	9.968	Percent Non-Detects	85.71%
Mean Detects	2.828	SD Detects	3.157
Median Detects	2.25	CV Detects	1.116
Skewness Detects	0.509	Kurtosis Detects	-1.62
Mean of Logged Detects	-0.25	SD of Logged Detects	2.147

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.835	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.297	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.484	KM Standard Error of Mean	0.245
KM SD	1.45	95% KM (BCA) UCL	0.932
95% KM (t) UCL	0.897	95% KM (Percentile Bootstrap) UCL	0.923
95% KM (z) UCL	0.887	95% KM Bootstrap t UCL	1.074
90% KM Chebyshev UCL	1.22	95% KM Chebyshev UCL	1.553
97.5% KM Chebyshev UCL	2.016	99% KM Chebyshev UCL	2.925

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.651	Anderson-Darling GOF Test	
5% A-D Critical Value	0.737	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.287	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.349	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.493	k star (bias corrected MLE)	0.358
Theta hat (MLE)	5.732	Theta star (bias corrected MLE)	7.904
nu hat (MLE)	5.921	nu star (bias corrected)	4.294
Mean (detects)	2.828		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.633
Maximum	7.5	Median	0.01
SD	1.513	CV	2.39
k hat (MLE)	0.282	k star (bias corrected MLE)	0.278
Theta hat (MLE)	2.243	Theta star (bias corrected MLE)	2.277
nu hat (MLE)	23.71	nu star (bias corrected)	23.35
Adjusted Level of Significance (β)	0.0443		
Approximate Chi Square Value (23.35, α)	13.36	Adjusted Chi Square Value (23.35, β)	13.09
95% Gamma Approximate UCL (use when n>=50)	1.107	95% Gamma Adjusted UCL (use when n<50)	1.13

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.484	SD (KM)	1.45
Variance (KM)	2.103	SE of Mean (KM)	0.245
k hat (KM)	0.111	k star (KM)	0.119
nu hat (KM)	9.35	nu star (KM)	10.02
theta hat (KM)	4.347	theta star (KM)	4.058
80% gamma percentile (KM)	0.421	90% gamma percentile (KM)	1.368

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95% gamma percentile (KM)	2.763	99% gamma percentile (KM)	7.028

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (10.02, α)	3.951	Adjusted Chi Square Value (10.02, β)	3.816
95% Gamma Approximate KM-UCL (use when n>=50)	1.226	95% Gamma Adjusted KM-UCL (use when n<50)	1.27

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.804	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.287	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.557	Mean in Log Scale	-2.158
SD in Original Scale	1.462	SD in Log Scale	1.651
95% t UCL (assumes normality of ROS data)	0.936	95% Percentile Bootstrap UCL	0.968
95% BCA Bootstrap UCL	1.125	95% Bootstrap t UCL	1.24
95% H-UCL (Log ROS)	1.021		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.098	KM Geo Mean	0.123
KM SD (logged)	1.078	95% Critical H Value (KM-Log)	2.444
KM Standard Error of Mean (logged)	0.197	95% H-UCL (KM -Log)	0.331
KM SD (logged)	1.078	95% Critical H Value (KM-Log)	2.444
KM Standard Error of Mean (logged)	0.197		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.554	Mean in Log Scale	-1.663
SD in Original Scale	1.456	SD in Log Scale	1.046
95% t UCL (Assumes normality)	0.932	95% H-Stat UCL	0.486

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.897

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_VOCs_VPHs|Naphthalene|ug/l

General Statistics

Total Number of Observations	31	Number of Distinct Observations	14
		Number of Missing Observations	12
Number of Detects	11	Number of Non-Detects	20
Number of Distinct Detects	11	Number of Distinct Non-Detects	3
Minimum Detect	0.18	Minimum Non-Detect	0.25
Maximum Detect	780	Maximum Non-Detect	5
Variance Detects	55224	Percent Non-Detects	64.52%
Mean Detects	71.45	SD Detects	235
Median Detects	0.65	CV Detects	3.289
Skewness Detects	3.317	Kurtosis Detects	11
Mean of Logged Detects	-0.124	SD of Logged Detects	2.382

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.347	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.85	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.526	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.251	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	25.49	KM Standard Error of Mean	25.95
KM SD	137.8	95% KM (BCA) UCL	75.8
95% KM (t) UCL	69.53	95% KM (Percentile Bootstrap) UCL	75.78
95% KM (z) UCL	68.17	95% KM Bootstrap t UCL	15217
90% KM Chebyshev UCL	103.3	95% KM Chebyshev UCL	138.6
97.5% KM Chebyshev UCL	187.5	99% KM Chebyshev UCL	283.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.874	Anderson-Darling GOF Test	
5% A-D Critical Value	0.887	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.498	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.284	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.171	k star (bias corrected MLE)	0.185
Theta hat (MLE)	416.6	Theta star (bias corrected MLE)	385.5
nu hat (MLE)	3.773	nu star (bias corrected)	4.077
Mean (detects)	71.45		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	25.36
Maximum	780	Median	0.01
SD	140.1	CV	5.522
k hat (MLE)	0.126	k star (bias corrected MLE)	0.135
Theta hat (MLE)	201.2	Theta star (bias corrected MLE)	187.3
nu hat (MLE)	7.816	nu star (bias corrected)	8.393
Adjusted Level of Significance (β)	0.0413		
Approximate Chi Square Value (8.39, α)	2.965	Adjusted Chi Square Value (8.39, β)	2.788
95% Gamma Approximate UCL (use when n>=50)	71.8	95% Gamma Adjusted UCL (use when n<50)	76.36

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	25.49	SD (KM)	137.8
Variance (KM)	18976	SE of Mean (KM)	25.95
k hat (KM)	0.0342	k star (KM)	0.0524
nu hat (KM)	2.122	nu star (KM)	3.25
theta hat (KM)	744.6	theta star (KM)	486.2
80% gamma percentile (KM)	4.066	90% gamma percentile (KM)	41.29

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95% gamma percentile (KM)	137.8	99% gamma percentile (KM)	544

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.25, α)	0.45	Adjusted Chi Square Value (3.25, β)	0.401
95% Gamma Approximate KM-UCL (use when n>=50)	184	95% Gamma Adjusted KM-UCL (use when n<50)	206.6

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.64	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.85	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.321	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.251	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	25.49	Mean in Log Scale	-1.348
SD in Original Scale	140	SD in Log Scale	1.881
95% t UCL (assumes normality of ROS data)	68.18	95% Percentile Bootstrap UCL	75.77
95% BCA Bootstrap UCL	126.1	95% Bootstrap t UCL	13537
95% H-UCL (Log ROS)	5.303		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.085	KM Geo Mean	0.338
KM SD (logged)	1.535	95% Critical H Value (KM-Log)	3.126
KM Standard Error of Mean (logged)	0.291	95% H-UCL (KM -Log)	2.637
KM SD (logged)	1.535	95% Critical H Value (KM-Log)	3.126
KM Standard Error of Mean (logged)	0.291		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	25.54	Mean in Log Scale	-1.133
SD in Original Scale	140	SD in Log Scale	1.667
95% t UCL (Assumes normality)	68.22	95% H-Stat UCL	3.543

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	187.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_WG_VOCs_VPHs|Tetrachloroethene|ug/l

General Statistics

Total Number of Observations	42	Number of Distinct Observations	18
		Number of Missing Observations	1
Number of Detects	18	Number of Non-Detects	24
Number of Distinct Detects	15	Number of Distinct Non-Detects	3
Minimum Detect	0.13	Minimum Non-Detect	0.25
Maximum Detect	5.8	Maximum Non-Detect	5
Variance Detects	2.174	Percent Non-Detects	57.14%
Mean Detects	1.168	SD Detects	1.474
Median Detects	0.6	CV Detects	1.263
Skewness Detects	2.245	Kurtosis Detects	5.414
Mean of Logged Detects	-0.487	SD of Logged Detects	1.175

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.707	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.259	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.202	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.615	KM Standard Error of Mean	0.17
KM SD	1.06	95% KM (BCA) UCL	0.918
95% KM (t) UCL	0.901	95% KM (Percentile Bootstrap) UCL	0.917
95% KM (z) UCL	0.895	95% KM Bootstrap t UCL	1.168
90% KM Chebyshev UCL	1.125	95% KM Chebyshev UCL	1.355
97.5% KM Chebyshev UCL	1.676	99% KM Chebyshev UCL	2.305

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.637	Anderson-Darling GOF Test	
5% A-D Critical Value	0.771	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.187	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.21	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.909	k star (bias corrected MLE)	0.795
Theta hat (MLE)	1.284	Theta star (bias corrected MLE)	1.469
nu hat (MLE)	32.74	nu star (bias corrected)	28.61
Mean (detects)	1.168		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.561
Maximum	5.8	Median	0.147
SD	1.097	CV	1.954
k hat (MLE)	0.394	k star (bias corrected MLE)	0.381
Theta hat (MLE)	1.427	Theta star (bias corrected MLE)	1.472
nu hat (MLE)	33.06	nu star (bias corrected)	32.03
Adjusted Level of Significance (β)	0.0443		
Approximate Chi Square Value (32.03, α)	20.09	Adjusted Chi Square Value (32.03, β)	19.76
95% Gamma Approximate UCL (use when n>=50)	0.895	95% Gamma Adjusted UCL (use when n<50)	0.91

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.615	SD (KM)	1.06
Variance (KM)	1.125	SE of Mean (KM)	0.17
k hat (KM)	0.337	k star (KM)	0.328
nu hat (KM)	28.28	nu star (KM)	27.59
theta hat (KM)	1.828	theta star (KM)	1.873
80% gamma percentile (KM)	0.963	90% gamma percentile (KM)	1.794

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95% gamma percentile (KM)	2.733	99% gamma percentile (KM)	5.147

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (27.59, α)	16.61	Adjusted Chi Square Value (27.59, β)	16.31
95% Gamma Approximate KM-UCL (use when n>=50)	1.022	95% Gamma Adjusted KM-UCL (use when n<50)	1.041

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.936	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.897	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.147	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.202	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.631	Mean in Log Scale	-1.181
SD in Original Scale	1.065	SD in Log Scale	1.112
95% t UCL (assumes normality of ROS data)	0.907	95% Percentile Bootstrap UCL	0.923
95% BCA Bootstrap UCL	1.04	95% Bootstrap t UCL	1.186
95% H-UCL (Log ROS)	0.877		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.18	KM Geo Mean	0.307
KM SD (logged)	0.997	95% Critical H Value (KM-Log)	2.354
KM Standard Error of Mean (logged)	0.173	95% H-UCL (KM -Log)	0.729
KM SD (logged)	0.997	95% Critical H Value (KM-Log)	2.354
KM Standard Error of Mean (logged)	0.173		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.67	Mean in Log Scale	-1.095
SD in Original Scale	1.103	SD in Log Scale	1.037
95% t UCL (Assumes normality)	0.957	95% H-Stat UCL	0.845

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	1.041

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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RA_WG_VOCs_VPHs|Total Xylenes|ug/l

General Statistics			
Total Number of Observations	42	Number of Distinct Observations	11
		Number of Missing Observations	1
Number of Detects	7	Number of Non-Detects	35
Number of Distinct Detects	7	Number of Distinct Non-Detects	4
Minimum Detect	0.31	Minimum Non-Detect	0.6
Maximum Detect	41	Maximum Non-Detect	6
Variance Detects	256.3	Percent Non-Detects	83.33%
Mean Detects	9.144	SD Detects	16.01
Median Detects	0.38	CV Detects	1.751
Skewness Detects	1.743	Kurtosis Detects	2.266
Mean of Logged Detects	0.292	SD of Logged Detects	2.13

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.652	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.417	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	1.826	KM Standard Error of Mean	1.147
KM SD	6.879	95% KM (BCA) UCL	3.799
95% KM (t) UCL	3.755	95% KM (Percentile Bootstrap) UCL	3.786
95% KM (z) UCL	3.712	95% KM Bootstrap t UCL	77.82
90% KM Chebyshev UCL	5.266	95% KM Chebyshev UCL	6.824
97.5% KM Chebyshev UCL	8.987	99% KM Chebyshev UCL	13.24

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.186	Anderson-Darling GOF Test	
5% A-D Critical Value	0.776	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.413	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.333	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.35	k star (bias corrected MLE)	0.295
Theta hat (MLE)	26.13	Theta star (bias corrected MLE)	30.98
nu hat (MLE)	4.899	nu star (bias corrected)	4.133
Mean (detects)	9.144		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	2.543
Maximum	41	Median	0.01
SD	7.216	CV	2.838
k hat (MLE)	0.216	k star (bias corrected MLE)	0.216
Theta hat (MLE)	11.79	Theta star (bias corrected MLE)	11.76
nu hat (MLE)	18.12	nu star (bias corrected)	18.16
Adjusted Level of Significance (β)	0.0443		
Approximate Chi Square Value (18.16, α)	9.509	Adjusted Chi Square Value (18.16, β)	9.285
95% Gamma Approximate UCL (use when n>=50)	4.857	95% Gamma Adjusted UCL (use when n<50)	4.974

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	1.826	SD (KM)	6.879
Variance (KM)	47.32	SE of Mean (KM)	1.147
k hat (KM)	0.0704	k star (KM)	0.0813
nu hat (KM)	5.916	nu star (KM)	6.827
theta hat (KM)	25.92	theta star (KM)	22.46
80% gamma percentile (KM)	0.896	90% gamma percentile (KM)	4.371

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95% gamma percentile (KM)	10.62	99% gamma percentile (KM)	32.09

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.83, α)	2.076	Adjusted Chi Square Value (6.83, β)	1.984
95% Gamma Approximate KM-UCL (use when n>=50)	6.004	95% Gamma Adjusted KM-UCL (use when n<50)	6.281

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.702	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.355	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.11	Mean in Log Scale	-0.71
SD in Original Scale	6.936	SD in Log Scale	1.392
95% t UCL (assumes normality of ROS data)	3.911	95% Percentile Bootstrap UCL	4.075
95% BCA Bootstrap UCL	5.099	95% Bootstrap t UCL	18.24
95% H-UCL (Log ROS)	2.395		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.809	KM Geo Mean	0.445
KM SD (logged)	0.953	95% Critical H Value (KM-Log)	2.306
KM Standard Error of Mean (logged)	0.166	95% H-UCL (KM -Log)	0.989
KM SD (logged)	0.953	95% Critical H Value (KM-Log)	2.306
KM Standard Error of Mean (logged)	0.166		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.972	Mean in Log Scale	-0.602
SD in Original Scale	6.944	SD in Log Scale	1.013
95% t UCL (Assumes normality)	3.775	95% H-Stat UCL	1.332

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	8.987

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Groundwater

RA_WG_VOCs_VPHs|Trichloroethylene|ug/l

General Statistics			
Total Number of Observations	42	Number of Distinct Observations	24
		Number of Missing Observations	1
Number of Detects	25	Number of Non-Detects	17
Number of Distinct Detects	22	Number of Distinct Non-Detects	2
Minimum Detect	0.11	Minimum Non-Detect	0.25
Maximum Detect	180	Maximum Non-Detect	0.5
Variance Detects	2050	Percent Non-Detects	40.48%
Mean Detects	25.92	SD Detects	45.27
Median Detects	5.1	CV Detects	1.747
Skewness Detects	2.419	Kurtosis Detects	5.709
Mean of Logged Detects	1.711	SD of Logged Detects	2.009

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.624	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.301	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	15.51	KM Standard Error of Mean	5.745
KM SD	36.48	95% KM (BCA) UCL	25.78
95% KM (t) UCL	25.17	95% KM (Percentile Bootstrap) UCL	25.45
95% KM (z) UCL	24.96	95% KM Bootstrap t UCL	33.71
90% KM Chebyshev UCL	32.74	95% KM Chebyshev UCL	40.55
97.5% KM Chebyshev UCL	51.38	99% KM Chebyshev UCL	72.67

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.707	Anderson-Darling GOF Test	
5% A-D Critical Value	0.824	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.175	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.186	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.423	k star (bias corrected MLE)	0.398
Theta hat (MLE)	61.35	Theta star (bias corrected MLE)	65.05
nu hat (MLE)	21.13	nu star (bias corrected)	19.92
Mean (detects)	25.92		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	15.43
Maximum	180	Median	0.545
SD	36.95	CV	2.394
k hat (MLE)	0.205	k star (bias corrected MLE)	0.206
Theta hat (MLE)	75.39	Theta star (bias corrected MLE)	74.93
nu hat (MLE)	17.2	nu star (bias corrected)	17.3
Adjusted Level of Significance (β)	0.0443		
Approximate Chi Square Value (17.30, α)	8.887	Adjusted Chi Square Value (17.30, β)	8.672
95% Gamma Approximate UCL (use when n>=50)	30.04	95% Gamma Adjusted UCL (use when n<50)	30.79

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	15.51	SD (KM)	36.48
Variance (KM)	1331	SE of Mean (KM)	5.745
k hat (KM)	0.181	k star (KM)	0.184
nu hat (KM)	15.17	nu star (KM)	15.42
theta hat (KM)	85.83	theta star (KM)	84.44
80% gamma percentile (KM)	19.47	90% gamma percentile (KM)	46.8

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95% gamma percentile (KM)	81.63	99% gamma percentile (KM)	178.9

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (15.42, α)	7.557	Adjusted Chi Square Value (15.42, β)	7.361
95% Gamma Approximate KM-UCL (use when n>=50)	31.64	95% Gamma Adjusted KM-UCL (use when n<50)	32.49

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.973	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0917	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	15.5	Mean in Log Scale	0.0225
SD in Original Scale	36.92	SD in Log Scale	2.731
95% t UCL (assumes normality of ROS data)	25.09	95% Percentile Bootstrap UCL	25.61
95% BCA Bootstrap UCL	29.28	95% Bootstrap t UCL	33.2
95% H-UCL (Log ROS)	319.4		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.257	KM Geo Mean	1.293
KM SD (logged)	2.357	95% Critical H Value (KM-Log)	4.169
KM Standard Error of Mean (logged)	0.381	95% H-UCL (KM -Log)	96.51
KM SD (logged)	2.357	95% Critical H Value (KM-Log)	4.169
KM Standard Error of Mean (logged)	0.381		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	15.52	Mean in Log Scale	0.375
SD in Original Scale	36.92	SD in Log Scale	2.257
95% t UCL (Assumes normality)	25.1	95% H-Stat UCL	76.63

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 32.49

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Groundwater

RA_WG_VOCs_VPHs|Vinyl Chloride|ug/l

General Statistics

Total Number of Observations	42	Number of Distinct Observations	6
		Number of Missing Observations	1
Number of Detects	2	Number of Non-Detects	40
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	1.2	Minimum Non-Detect	0.25
Maximum Detect	2	Maximum Non-Detect	5
Variance Detects	0.32	Percent Non-Detects	95.24%
Mean Detects	1.6	SD Detects	0.566
Median Detects	1.6	CV Detects	0.354
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	0.438	SD of Logged Detects	0.361

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.316	KM Standard Error of Mean	0.0671
KM SD	0.304	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.429	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.426	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.517	95% KM Chebyshev UCL	0.608
97.5% KM Chebyshev UCL	0.735	99% KM Chebyshev UCL	0.984

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	15.66	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.102	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	62.64	nu star (bias corrected)	N/A
Mean (detects)	1.6		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.316	SD (KM)	0.304
Variance (KM)	0.0924	SE of Mean (KM)	0.0671
k hat (KM)	1.08	k star (KM)	1.019
nu hat (KM)	90.72	nu star (KM)	85.58
theta hat (KM)	0.292	theta star (KM)	0.31
80% gamma percentile (KM)	0.508	90% gamma percentile (KM)	0.724
95% gamma percentile (KM)	0.94	99% gamma percentile (KM)	1.441

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0443
Approximate Chi Square Value (85.58, α)	65.25	Adjusted Chi Square Value (85.58, β)	64.62
95% Gamma Approximate KM-UCL (use when n>=50)	0.414	95% Gamma Adjusted KM-UCL (use when n<50)	0.418

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.16	Mean in Log Scale	-3.009
SD in Original Scale	0.354	SD in Log Scale	1.521
95% t UCL (assumes normality of ROS data)	0.252	95% Percentile Bootstrap UCL	0.258
95% BCA Bootstrap UCL	0.303	95% Bootstrap t UCL	0.435
95% H-UCL (Log ROS)	0.319		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.297	KM Geo Mean	0.273
KM SD (logged)	0.397	95% Critical H Value (KM-Log)	1.83

On-Project Blue Beach Area Groundwater

KM Standard Error of Mean (logged)	0.0877	95% H-UCL (KM -Log)	0.331
KM SD (logged)	0.397	95% Critical H Value (KM-Log)	1.83
KM Standard Error of Mean (logged)	0.0877		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.377	Mean in Log Scale	-1.377
SD in Original Scale	0.477	SD in Log Scale	0.804
95% t UCL (Assumes normality)	0.501	95% H-Stat UCL	0.457

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.429	KM H-UCL	0.331
95% KM (BCA) UCL	N/A		

Warning: One or more Recommended UCL(s) not available!

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL Input/Output
On-Project Blue Beach Area Shallow Groundwater

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_Metals|Antimony|ug/l	D_RA_WG_Metals|Antimony|ug/l	RA_WG_Metals|Arsenic|ug/l	D_RA_WG_Metals|Arsenic|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.2	1	11.5	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.12	1	8.9	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0	4	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0	4	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0	4	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft			1	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	2.22	1	4	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0	2.9	1
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0	4	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0	4	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.5	0	4	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0	3	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft			3	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft			1	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft			1	0

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_Metals|Cadmium|ug/l	D_RA_WG_Metals|Cadmium|ug/l	RA_WG_Metals|Cobalt|ug/l	D_RA_WG_Metals|Cobalt|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.225	1	1.9	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.2	0	0.3	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.039	1	0.11	1
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.2	0	0.14	1
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.1	0		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.035	1	0.881	1
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.1	0		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.2	0	0.12	1
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	1.16	1	1.04	1
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.16	1	0.944	1
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	31.2	1	0.3	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.23	1	3.48	1
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.2	0	6.56	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.075	1		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.5	0		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.05	1		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.18	1		

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_Metals|Iron|ug/l	D_RA_WG_Metals|Iron|ug/l	RA_WG_Metals|Manganese|ug/l	D_RA_WG_Metals|Manganese|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	68200	1	2340	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	57400	1	1750	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	60	0	2.3	1
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	60	0	3.4	1
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft				
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	61	1	1.4	1
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft				
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	80	1	4.44	1
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	6060	1	38	1
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	581	1	1340	1
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	65	1	3.4	1
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	60	0	654	1
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	6450	1	3180	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft				
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft				
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft				
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft				

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_SVOCs-SIM|1-Methylnaphthalene|ug/l	D_RA_WG_SVOCs-SIM|1-Methylnaphthalene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	74	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	90	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.38	1
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.098	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_SVOCs-SIM|2-Methylnaphthalene|ug/l	D_RA_WG_SVOCs-SIM|2-Methylnaphthalene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	31.5	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	85	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.098	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_SVOCs-SIM|Benzo(a)anthracene|ug/l	D_RA_WG_SVOCs-SIM|Benzo(a)anthracene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.051	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.096	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.24	1
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.26	1
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.098	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.052	1
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_SVOCs-SIM|Benzo(a)Pyrene|ug/l	D_RA_WG_SVOCs-SIM|Benzo(a)Pyrene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.0745	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.22	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.22	1
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.098	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.093	1
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_SVOCs-SIM|Benzo(b)fluoranthene|ug/l	D_RA_WG_SVOCs-SIM|Benzo(b)fluoranthene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.38	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.24	1
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.24	1
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.098	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.095	1
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_SVOCs-SIM|Naphthalene|ug/l	D_RA_WG_SVOCs-SIM|Naphthalene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	160	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	250	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft		
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.096	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft		
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.092	1
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.098	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.093	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.094	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft		
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft		

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|1,2,4-Trimethylbenzene|ug/l	D_RA_WG_VOCs_VPHs|1,2,4-Trimethylbenzene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	8.1	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	320	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.26	1
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|1,2-Dichloropropane|ug/l	D_RA_WG_VOCs_VPHs|1,2-Dichloropropane|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.94	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|cis-1,2-Dichloroethene|ug/l	D_RA_WG_VOCs_VPHs|cis-1,2-Dichloroethene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	5.5	1
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.77	1
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	8.4	1
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.72	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	1.7	1
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	1.7	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|Ethylbenzene|ug/l	D_RA_WG_VOCs_VPHs|Ethylbenzene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	4.3	1
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	4.8	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.2	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.25	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|Total Xylenes|ug/l	D_RA_WG_VOCs_VPHs|Total Xylenes|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	41	1
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.6	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.6	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	1.5	0
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	0.75	0
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.75	0

On-Project Blue Beach Area Shallow Groundwater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WG_VOCs_VPHs|Trichloroethylene|ug/l	D_RA_WG_VOCs_VPHs|Trichloroethylene|ug/l
WG	T	GW-OnProject_BlueBeach	BB-3	10/30/2019 11:00 AM	14.46 - 14.46 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BB-4	10/28/2019 11:15 AM	13.7 - 13.7 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	BMW-3	10/29/2019 12:10 PM	9.71 - 9.71 ft	28	1
WG	T	GW-OnProject_BlueBeach	MW-101D	10/23/2019 11:40 AM	7.04 - 7.04 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	7/22/2014 12:00 AM	5 - 15 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-102	10/23/2019 3:00 PM	9.57 - 9.57 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	7/22/2014 12:00 AM	6 - 16 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-104	10/24/2019 10:52 AM	9.66 - 9.66 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-107	10/24/2019 12:24 PM	13.31 - 13.31 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108D	10/24/2019 11:22 AM	12.25 - 12.25 ft	0.5	0
WG	T	GW-OnProject_BlueBeach	MW-108S	10/24/2019 10:28 AM	12.36 - 12.36 ft	1.4	1
WG	T	GW-OnProject_BlueBeach	OW-3	10/29/2019 10:25 AM	9.65 - 9.65 ft	46	1
WG	T	GW-OnProject_BlueBeach	OW-9	10/22/2019 11:45 AM	12.45 - 12.45 ft	3.3	1
WG	T	GW-OnProject_BlueBeach	TS-3-C	7/22/2014 12:00 AM	14 - 15 ft	74	1
WG	T	GW-OnProject_BlueBeach	TS-3-D	8/5/2014 12:00 AM	13 - 15 ft	75	1
WG	T	GW-OnProject_BlueBeach	TS-UP-1	7/23/2014 12:00 AM	13 - 16 ft	1.4	1
WG	T	GW-OnProject_BlueBeach	TS-UP-2	7/24/2014 12:00 AM	13 - 16 ft	0.25	0

On-Project Blue Beach Area Shallow Groundwater

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/29/2020 12:47:27 PM
From File	Input_GW_Shallow.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_WG_Metals|Antimony|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	4
		Number of Missing Observations	2
Number of Detects	3	Number of Non-Detects	8
Number of Distinct Detects	3	Number of Distinct Non-Detects	1
Minimum Detect	0.12	Minimum Non-Detect	0.5
Maximum Detect	2.22	Maximum Non-Detect	0.5
Variance Detects	1.416	Percent Non-Detects	72.73%
Mean Detects	0.847	SD Detects	1.19
Median Detects	0.2	CV Detects	1.406
Skewness Detects	1.723	Kurtosis Detects	N/A
Mean of Logged Detects	-0.977	SD of Logged Detects	1.558

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.779	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.373	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.347	KM Standard Error of Mean	0.221
KM SD	0.593	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.748	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.711	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.01	95% KM Chebyshev UCL	1.31
97.5% KM Chebyshev UCL	1.727	99% KM Chebyshev UCL	2.546

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.74	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.145	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.438	nu star (bias corrected)	N/A
Mean (detects)	0.847		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.438
Maximum	2.22	Median	0.2
SD	0.661	CV	1.511
k hat (MLE)	0.523	k star (bias corrected MLE)	0.441
Theta hat (MLE)	0.837	Theta star (bias corrected MLE)	0.993
nu hat (MLE)	11.5	nu star (bias corrected)	9.7
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (9.70, α)	3.755	Adjusted Chi Square Value (9.70, β)	3.176

On-Project Blue Beach Area Shallow Groundwater

95% Gamma Approximate UCL (use when n>=50)	1.13	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.347	SD (KM)	0.593
Variance (KM)	0.352	SE of Mean (KM)	0.221
k hat (KM)	0.342	k star (KM)	0.31
nu hat (KM)	7.534	nu star (KM)	6.813
theta hat (KM)	1.014	theta star (KM)	1.121
80% gamma percentile (KM)	0.537	90% gamma percentile (KM)	1.02
95% gamma percentile (KM)	1.572	99% gamma percentile (KM)	3.002

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.81, α)	2.068	Adjusted Chi Square Value (6.81, β)	1.67
95% Gamma Approximate KM-UCL (use when n>=50)	1.144	95% Gamma Adjusted KM-UCL (use when n<50)	1.417

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.877	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.324	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.4	Mean in Log Scale	-1.602
SD in Original Scale	0.629	SD in Log Scale	1.149
95% t UCL (assumes normality of ROS data)	0.744	95% Percentile Bootstrap UCL	0.75
95% BCA Bootstrap UCL	0.958	95% Bootstrap t UCL	1.808
95% H-UCL (Log ROS)	1.29		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.623	KM Geo Mean	0.197
KM SD (logged)	0.803	95% Critical H Value (KM-Log)	2.637
KM Standard Error of Mean (logged)	0.347	95% H-UCL (KM -Log)	0.532
KM SD (logged)	0.803	95% Critical H Value (KM-Log)	2.637
KM Standard Error of Mean (logged)	0.347		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.413	Mean in Log Scale	-1.275
SD in Original Scale	0.601	SD in Log Scale	0.723
95% t UCL (Assumes normality)	0.741	95% H-Stat UCL	0.643

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.748

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_Metals|Arsenic|ug/l

General Statistics

Total Number of Observations	17	Number of Distinct Observations	6
Number of Detects	4	Number of Non-Detects	13
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	2.9	Minimum Non-Detect	1
Maximum Detect	11.5	Maximum Non-Detect	4
Variance Detects	18.65	Percent Non-Detects	76.47%
Mean Detects	6.575	SD Detects	4.318
Median Detects	5.95	CV Detects	0.657
Skewness Detects	0.304	Kurtosis Detects	-4.267
Mean of Logged Detects	1.698	SD of Logged Detects	0.719

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.851	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.296	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	2.547	KM Standard Error of Mean	0.857
KM SD	2.944	95% KM (BCA) UCL	N/A
95% KM (t) UCL	4.044	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	3.957	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	5.119	95% KM Chebyshev UCL	6.283
97.5% KM Chebyshev UCL	7.9	99% KM Chebyshev UCL	11.08

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.512	Anderson-Darling GOF Test	
5% A-D Critical Value	0.66	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.332	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.397	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.853	k star (bias corrected MLE)	0.88
Theta hat (MLE)	2.304	Theta star (bias corrected MLE)	7.471
nu hat (MLE)	22.83	nu star (bias corrected)	7.04
Mean (detects)	6.575		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.809
Maximum	11.5	Median	0.01
SD	3.399	CV	1.879
k hat (MLE)	0.232	k star (bias corrected MLE)	0.23
Theta hat (MLE)	7.796	Theta star (bias corrected MLE)	7.855
nu hat (MLE)	7.89	nu star (bias corrected)	7.831
Adjusted Level of Significance (β)	0.0346		
Approximate Chi Square Value (7.83, α)	2.637	Adjusted Chi Square Value (7.83, β)	2.332
95% Gamma Approximate UCL (use when n>=50)	5.371	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.547	SD (KM)	2.944
Variance (KM)	8.668	SE of Mean (KM)	0.857
k hat (KM)	0.749	k star (KM)	0.656
nu hat (KM)	25.46	nu star (KM)	22.3
theta hat (KM)	3.403	theta star (KM)	3.885
80% gamma percentile (KM)	4.195	90% gamma percentile (KM)	6.493
95% gamma percentile (KM)	8.877	99% gamma percentile (KM)	14.6

On-Project Blue Beach Area Shallow Groundwater

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (22.30, α)	12.56	Adjusted Chi Square Value (22.30, β)	11.8
95% Gamma Approximate KM-UCL (use when n>=50)	4.522	95% Gamma Adjusted KM-UCL (use when n<50)	4.814
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.821	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.298	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	2.351	Mean in Log Scale	0.238
SD in Original Scale	3.137	SD in Log Scale	1.109
95% t UCL (assumes normality of ROS data)	3.679	95% Percentile Bootstrap UCL	3.719
95% BCA Bootstrap UCL	4.29	95% Bootstrap t UCL	5.898
95% H-UCL (Log ROS)	5.15		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	0.53	KM Geo Mean	1.7
KM SD (logged)	0.793	95% Critical H Value (KM-Log)	2.35
KM Standard Error of Mean (logged)	0.258	95% H-UCL (KM -Log)	3.712
KM SD (logged)	0.793	95% Critical H Value (KM-Log)	2.35
KM Standard Error of Mean (logged)	0.258		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.606	Mean in Log Scale	0.505
SD in Original Scale	3.01	SD in Log Scale	0.958
95% t UCL (Assumes normality)	3.88	95% H-Stat UCL	4.897
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	4.044		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_Metals|Cadmium|ug/l

General Statistics

Total Number of Observations	17	Number of Distinct Observations	13
Number of Detects	10	Number of Non-Detects	7
Number of Distinct Detects	10	Number of Distinct Non-Detects	3
Minimum Detect	0.035	Minimum Non-Detect	0.1
Maximum Detect	31.2	Maximum Non-Detect	0.5
Variance Detects	95.97	Percent Non-Detects	41.18%
Mean Detects	3.335	SD Detects	9.796
Median Detects	0.17	CV Detects	2.937
Skewness Detects	3.156	Kurtosis Detects	9.968
Mean of Logged Detects	-1.51	SD of Logged Detects	2.033

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.388	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.488	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.993	KM Standard Error of Mean	1.868
KM SD	7.306	95% KM (BCA) UCL	5.642
95% KM (t) UCL	5.254	95% KM (Percentile Bootstrap) UCL	5.64
95% KM (z) UCL	5.065	95% KM Bootstrap t UCL	176.5
90% KM Chebyshev UCL	7.596	95% KM Chebyshev UCL	10.13
97.5% KM Chebyshev UCL	13.66	99% KM Chebyshev UCL	20.58

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.84	Anderson-Darling GOF Test	
5% A-D Critical Value	0.83	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.413	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.29	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.26	k star (bias corrected MLE)	0.249
Theta hat (MLE)	12.83	Theta star (bias corrected MLE)	13.41
nu hat (MLE)	5.2	nu star (bias corrected)	4.973
Mean (detects)	3.335		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.966
Maximum	31.2	Median	0.039
SD	7.538	CV	3.834
k hat (MLE)	0.211	k star (bias corrected MLE)	0.213
Theta hat (MLE)	9.323	Theta star (bias corrected MLE)	9.235
nu hat (MLE)	7.17	nu star (bias corrected)	7.238
Adjusted Level of Significance (β)	0.0346		
Approximate Chi Square Value (7.24, α)	2.302	Adjusted Chi Square Value (7.24, β)	2.021
95% Gamma Approximate UCL (use when n>=50)	6.181	95% Gamma Adjusted UCL (use when n<50)	7.04

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.993	SD (KM)	7.306
Variance (KM)	53.38	SE of Mean (KM)	1.868
k hat (KM)	0.0744	k star (KM)	0.1
nu hat (KM)	2.529	nu star (KM)	3.416
theta hat (KM)	26.79	theta star (KM)	19.83
80% gamma percentile (KM)	1.392	90% gamma percentile (KM)	5.313
95% gamma percentile (KM)	11.56	99% gamma percentile (KM)	31.58

On-Project Blue Beach Area Shallow Groundwater

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (3.42, α)	0.506	Adjusted Chi Square Value (3.42, β)	0.408
95% Gamma Approximate KM-UCL (use when n>=50)	13.46	95% Gamma Adjusted KM-UCL (use when n<50)	16.69
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.808	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.292	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	1.993	Mean in Log Scale	-2.062
SD in Original Scale	7.531	SD in Log Scale	1.746
95% t UCL (assumes normality of ROS data)	5.182	95% Percentile Bootstrap UCL	5.635
95% BCA Bootstrap UCL	7.541	95% Bootstrap t UCL	201.9
95% H-UCL (Log ROS)	3.236		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-2.038	KM Geo Mean	0.13
KM SD (logged)	1.651	95% Critical H Value (KM-Log)	3.75
KM Standard Error of Mean (logged)	0.439	95% H-UCL (KM -Log)	2.389
KM SD (logged)	1.651	95% Critical H Value (KM-Log)	3.75
KM Standard Error of Mean (logged)	0.439		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.006	Mean in Log Scale	-1.864
SD in Original Scale	7.528	SD in Log Scale	1.62
95% t UCL (Assumes normality)	5.194	95% H-Stat UCL	2.572
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Level			
Suggested UCL to Use			
99% KM (Chebyshev) UCL	20.58		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_Metals|Cobalt|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
		Number of Missing Observations	2
Number of Detects	9	Number of Non-Detects	2
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	0.11	Minimum Non-Detect	0.3
Maximum Detect	6.56	Maximum Non-Detect	0.3
Variance Detects	4.495	Percent Non-Detects	18.18%
Mean Detects	1.686	SD Detects	2.12
Median Detects	0.944	CV Detects	1.257
Skewness Detects	1.836	Kurtosis Detects	3.295
Mean of Logged Detects	-0.297	SD of Logged Detects	1.499

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.767	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.286	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.402	KM Standard Error of Mean	0.61
KM SD	1.906	95% KM (BCA) UCL	2.495
95% KM (t) UCL	2.507	95% KM (Percentile Bootstrap) UCL	2.473
95% KM (z) UCL	2.405	95% KM Bootstrap t UCL	4.285
90% KM Chebyshev UCL	3.231	95% KM Chebyshev UCL	4.059
97.5% KM Chebyshev UCL	5.208	99% KM Chebyshev UCL	7.467

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.368	Anderson-Darling GOF Test	
5% A-D Critical Value	0.753	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.197	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.29	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.733	k star (bias corrected MLE)	0.563
Theta hat (MLE)	2.3	Theta star (bias corrected MLE)	2.995
nu hat (MLE)	13.2	nu star (bias corrected)	10.13
Mean (detects)	1.686		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.381
Maximum	6.56	Median	0.881
SD	2.014	CV	1.458
k hat (MLE)	0.459	k star (bias corrected MLE)	0.394
Theta hat (MLE)	3.01	Theta star (bias corrected MLE)	3.503
nu hat (MLE)	10.09	nu star (bias corrected)	8.675
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (8.68, α)	3.132	Adjusted Chi Square Value (8.68, β)	2.614
95% Gamma Approximate UCL (use when n>=50)	3.826	95% Gamma Adjusted UCL (use when n<50)	4.585

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.402	SD (KM)	1.906
Variance (KM)	3.633	SE of Mean (KM)	0.61
k hat (KM)	0.541	k star (KM)	0.454
nu hat (KM)	11.9	nu star (KM)	9.99
theta hat (KM)	2.591	theta star (KM)	3.087
80% gamma percentile (KM)	2.29	90% gamma percentile (KM)	3.867

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95% gamma percentile (KM)	5.573	99% gamma percentile (KM)	9.805

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (9.99, α)	3.936	Adjusted Chi Square Value (9.99, β)	3.34
95% Gamma Approximate KM-UCL (use when n>=50)	3.559	95% Gamma Adjusted KM-UCL (use when n<50)	4.194

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.904	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.212	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	1.408	Mean in Log Scale	-0.595
SD in Original Scale	1.995	SD in Log Scale	1.509
95% t UCL (assumes normality of ROS data)	2.498	95% Percentile Bootstrap UCL	2.43
95% BCA Bootstrap UCL	2.695	95% Bootstrap t UCL	4.282
95% H-UCL (Log ROS)	11.92		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.624	KM Geo Mean	0.536
KM SD (logged)	1.455	95% Critical H Value (KM-Log)	3.935
KM Standard Error of Mean (logged)	0.466	95% H-UCL (KM -Log)	9.45
KM SD (logged)	1.455	95% Critical H Value (KM-Log)	3.935
KM Standard Error of Mean (logged)	0.466		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.407	Mean in Log Scale	-0.588
SD in Original Scale	1.996	SD in Log Scale	1.489
95% t UCL (Assumes normality)	2.497	95% H-Stat UCL	11.1
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Level			

Suggested UCL to Use			
95% KM Bootstrap t UCL	4.285	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	4.194

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_Metals|Iron|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	9
		Number of Missing Observations	2
Number of Detects	8	Number of Non-Detects	3
Number of Distinct Detects	8	Number of Distinct Non-Detects	1
Minimum Detect	61	Minimum Non-Detect	60
Maximum Detect	68200	Maximum Non-Detect	60
Variance Detects	8.019E+8	Percent Non-Detects	27.27%
Mean Detects	17362	SD Detects	28317
Median Detects	3321	CV Detects	1.631
Skewness Detects	1.448	Kurtosis Detects	0.233
Mean of Logged Detects	7.325	SD of Logged Detects	2.965

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.658	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.4	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	12643	KM Standard Error of Mean	7693
KM SD	23868	95% KM (BCA) UCL	24630
95% KM (t) UCL	26587	95% KM (Percentile Bootstrap) UCL	24985
95% KM (z) UCL	25298	95% KM Bootstrap t UCL	120599
90% KM Chebyshev UCL	35723	95% KM Chebyshev UCL	46177
97.5% KM Chebyshev UCL	60688	99% KM Chebyshev UCL	89190

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.554	Anderson-Darling GOF Test	
5% A-D Critical Value	0.803	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.208	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.318	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.285	k star (bias corrected MLE)	0.262
Theta hat (MLE)	60856	Theta star (bias corrected MLE)	66358
nu hat (MLE)	4.565	nu star (bias corrected)	4.186
Mean (detects)	17362		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	12627
Maximum	68200	Median	80
SD	25042	CV	1.983
k hat (MLE)	0.144	k star (bias corrected MLE)	0.165
Theta hat (MLE)	87734	Theta star (bias corrected MLE)	76398
nu hat (MLE)	3.166	nu star (bias corrected)	3.636
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (3.64, α)	0.583	Adjusted Chi Square Value (3.64, β)	0.421
95% Gamma Approximate UCL (use when n>=50)	78692	95% Gamma Adjusted UCL (use when n<50)	109160

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	12643	SD (KM)	23868
Variance (KM)	5.697E+8	SE of Mean (KM)	7693
k hat (KM)	0.281	k star (KM)	0.265
nu hat (KM)	6.173	nu star (KM)	5.823
theta hat (KM)	45056	theta star (KM)	47767
80% gamma percentile (KM)	18719	90% gamma percentile (KM)	37779

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95% gamma percentile (KM)	60154	99% gamma percentile (KM)	119252

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.82, α)	1.55	Adjusted Chi Square Value (5.82, β)	1.22
95% Gamma Approximate KM-UCL (use when n>=50)	47494	95% Gamma Adjusted KM-UCL (use when n<50)	60325

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.864	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.215	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	12628	Mean in Log Scale	5.319
SD in Original Scale	25041	SD in Log Scale	4.296
95% t UCL (assumes normality of ROS data)	26312	95% Percentile Bootstrap UCL	25242
95% BCA Bootstrap UCL	29611	95% Bootstrap t UCL	124031
95% H-UCL (Log ROS)	3.642E+12		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	6.444	KM Geo Mean	628.9
KM SD (logged)	2.768	95% Critical H Value (KM-Log)	6.941
KM Standard Error of Mean (logged)	0.892	95% H-UCL (KM -Log)	12642178
KM SD (logged)	2.768	95% Critical H Value (KM-Log)	6.941
KM Standard Error of Mean (logged)	0.892		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	12635	Mean in Log Scale	6.255
SD in Original Scale	25037	SD in Log Scale	3.084
95% t UCL (Assumes normality)	26317	95% H-Stat UCL	1.092E+8

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Bootstrap t UCL	120599	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	60325

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_Metals|Manganese|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
		Number of Missing Observations	2
Minimum	1.4	Mean	847
Maximum	3180	Median	38
SD	1139	Std. Error of Mean	343.6
Coefficient of Variation	1.345	Skewness	1.102

Normal GOF Test

Shapiro Wilk Test Statistic	0.782	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.307	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1470	95% Adjusted-CLT UCL (Chen-1995)	1534
		95% Modified-t UCL (Johnson-1978)	1489

Gamma GOF Test

A-D Test Statistic	0.886	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.832	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.267	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.278	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.271	k star (bias corrected MLE)	0.258
Theta hat (MLE)	3124	Theta star (bias corrected MLE)	3285
nu hat (MLE)	5.965	nu star (bias corrected)	5.672
MLE Mean (bias corrected)	847	MLE Sd (bias corrected)	1668
		Approximate Chi Square Value (0.05)	1.474
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	1.156

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	3258	95% Adjusted Gamma UCL (use when n<50)	4157

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.819	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.85	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.25	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.336	Mean of logged Data	4.156
Maximum of Logged Data	8.065	SD of logged Data	3.226

Assuming Lognormal Distribution

95% H-UCL	41721897	90% Chebyshev (MVUE) UCL	9194
95% Chebyshev (MVUE) UCL	12211	97.5% Chebyshev (MVUE) UCL	16398
99% Chebyshev (MVUE) UCL	24623		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1412	95% Jackknife UCL	1470
95% Standard Bootstrap UCL	1371	95% Bootstrap-t UCL	1693
95% Hall's Bootstrap UCL	1463	95% Percentile Bootstrap UCL	1419
95% BCA Bootstrap UCL	1461		
90% Chebyshev(Mean, Sd) UCL	1878	95% Chebyshev(Mean, Sd) UCL	2345
97.5% Chebyshev(Mean, Sd) UCL	2993	99% Chebyshev(Mean, Sd) UCL	4265

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Suggested UCL to Use
95% Adjusted Gamma UCL 4157

Recommended UCL exceeds the maximum observation

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_SVOCs-SIM|1-Methylnaphthalene|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	7
		Number of Missing Observations	2
Number of Detects	3	Number of Non-Detects	8
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.38	Minimum Non-Detect	0.093
Maximum Detect	90	Maximum Non-Detect	0.098
Variance Detects	2285	Percent Non-Detects	72.73%
Mean Detects	54.79	SD Detects	47.8
Median Detects	74	CV Detects	0.872
Skewness Detects	-1.516	Kurtosis Detects	N/A
Mean of Logged Detects	2.612	SD of Logged Detects	3.102

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.879	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.323	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	15.01	KM Standard Error of Mean	11.73
KM SD	31.76	95% KM (BCA) UCL	N/A
95% KM (t) UCL	36.27	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	34.3	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	50.2	95% KM Chebyshev UCL	66.14
97.5% KM Chebyshev UCL	88.26	99% KM Chebyshev UCL	131.7

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.462	k star (bias corrected MLE)	N/A
Theta hat (MLE)	118.6	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.773	nu star (bias corrected)	N/A
Mean (detects)	54.79		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	14.95
Maximum	90	Median	0.01
SD	33.34	CV	2.23
k hat (MLE)	0.145	k star (bias corrected MLE)	0.166
Theta hat (MLE)	103.4	Theta star (bias corrected MLE)	90.17
nu hat (MLE)	3.182	nu star (bias corrected)	3.648
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (3.65, α)	0.588	Adjusted Chi Square Value (3.65, β)	0.424
95% Gamma Approximate UCL (use when n>=50)	92.8	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	15.01	SD (KM)	31.76
Variance (KM)	1009	SE of Mean (KM)	11.73
k hat (KM)	0.223	k star (KM)	0.223
nu hat (KM)	4.914	nu star (KM)	4.907
theta hat (KM)	67.21	theta star (KM)	67.3
80% gamma percentile (KM)	20.84	90% gamma percentile (KM)	45.33

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95% gamma percentile (KM)	75.1	99% gamma percentile (KM)	155.7

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.91, α)	1.109	Adjusted Chi Square Value (4.91, β)	0.847
95% Gamma Approximate KM-UCL (use when n>=50)	66.39	95% Gamma Adjusted KM-UCL (use when n<50)	86.96

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.777	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.374	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	14.94	Mean in Log Scale	-5.813
SD in Original Scale	33.35	SD in Log Scale	6.073
95% t UCL (assumes normality of ROS data)	33.17	95% Percentile Bootstrap UCL	31.31
95% BCA Bootstrap UCL	36.61	95% Bootstrap t UCL	4368
95% H-UCL (Log ROS)	7.650E+17		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.015	KM Geo Mean	0.362
KM SD (logged)	2.585	95% Critical H Value (KM-Log)	6.511
KM Standard Error of Mean (logged)	0.955	95% H-UCL (KM -Log)	2098
KM SD (logged)	2.585	95% Critical H Value (KM-Log)	6.511
KM Standard Error of Mean (logged)	0.955		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	14.98	Mean in Log Scale	-1.507
SD in Original Scale	33.33	SD in Log Scale	2.987
95% t UCL (Assumes normality)	33.19	95% H-Stat UCL	22002

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	36.27

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_SVOCs-SIM|2-Methylnaphthalene|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	6
		Number of Missing Observations	2
Number of Detects	2	Number of Non-Detects	9
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	31.5	Minimum Non-Detect	0.093
Maximum Detect	85	Maximum Non-Detect	0.098
Variance Detects	1431	Percent Non-Detects	81.82%
Mean Detects	58.25	SD Detects	37.83
Median Detects	58.25	CV Detects	0.649
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	3.946	SD of Logged Detects	0.702

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	10.67	KM Standard Error of Mean	10.73
KM SD	25.16	95% KM (BCA) UCL	N/A
95% KM (t) UCL	30.11	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	28.32	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	42.86	95% KM Chebyshev UCL	57.44
97.5% KM Chebyshev UCL	77.68	99% KM Chebyshev UCL	117.4

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	4.382	k star (bias corrected MLE)	N/A
Theta hat (MLE)	13.29	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	17.53	nu star (bias corrected)	N/A
Mean (detects)	58.25		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	10.67	SD (KM)	25.16
Variance (KM)	633.2	SE of Mean (KM)	10.73
k hat (KM)	0.18	k star (KM)	0.191
nu hat (KM)	3.953	nu star (KM)	4.208
theta hat (KM)	59.36	theta star (KM)	55.76
80% gamma percentile (KM)	13.72	90% gamma percentile (KM)	32.24
95% gamma percentile (KM)	55.59	99% gamma percentile (KM)	120.4

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0278
Approximate Chi Square Value (4.21, α)	0.806	Adjusted Chi Square Value (4.21, β)	0.597
95% Gamma Approximate KM-UCL (use when n>=50)	55.72	95% Gamma Adjusted KM-UCL (use when n<50)	75.17

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	11.64	Mean in Log Scale	0.513
SD in Original Scale	25.99	SD in Log Scale	1.988
95% t UCL (assumes normality of ROS data)	25.84	95% Percentile Bootstrap UCL	24.56
95% BCA Bootstrap UCL	31.65	95% Bootstrap t UCL	249.5
95% H-UCL (Log ROS)	302.5		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.226	KM Geo Mean	0.294
KM SD (logged)	2.447	95% Critical H Value (KM-Log)	6.189

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KM Standard Error of Mean (logged)	1.044	95% H-UCL (KM -Log)	705
KM SD (logged)	2.447	95% Critical H Value (KM-Log)	6.189
KM Standard Error of Mean (logged)	1.044		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	10.63	Mean in Log Scale	-1.779
SD in Original Scale	26.41	SD in Log Scale	2.84
95% t UCL (Assumes normality)	25.06	95% H-Stat UCL	5633

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	57.44

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_SVOCs-SIM|Benzo(a)anthracene|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	8
		Number of Missing Observations	2
Number of Detects	5	Number of Non-Detects	6
Number of Distinct Detects	5	Number of Distinct Non-Detects	4
Minimum Detect	0.051	Minimum Non-Detect	0.093
Maximum Detect	0.26	Maximum Non-Detect	0.098
Variance Detects	0.0105	Percent Non-Detects	54.55%
Mean Detects	0.14	SD Detects	0.102
Median Detects	0.096	CV Detects	0.733
Skewness Detects	0.496	Kurtosis Detects	-3.07
Mean of Logged Detects	-2.21	SD of Logged Detects	0.794

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.808	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.265	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0921	KM Standard Error of Mean	0.0256
KM SD	0.0757	95% KM (BCA) UCL	0.15
95% KM (t) UCL	0.138	95% KM (Percentile Bootstrap) UCL	0.138
95% KM (z) UCL	0.134	95% KM Bootstrap t UCL	0.217
90% KM Chebyshev UCL	0.169	95% KM Chebyshev UCL	0.204
97.5% KM Chebyshev UCL	0.252	99% KM Chebyshev UCL	0.347

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.524	Anderson-Darling GOF Test	
5% A-D Critical Value	0.684	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.264	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.36	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.214	k star (bias corrected MLE)	1.019
Theta hat (MLE)	0.0631	Theta star (bias corrected MLE)	0.137
nu hat (MLE)	22.14	nu star (bias corrected)	10.19
Mean (detects)	0.14		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0113	Mean	0.0892
Maximum	0.26	Median	0.052
SD	0.0825	CV	0.925
k hat (MLE)	1.645	k star (bias corrected MLE)	1.257
Theta hat (MLE)	0.0542	Theta star (bias corrected MLE)	0.0709
nu hat (MLE)	36.18	nu star (bias corrected)	27.65
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (27.65, α)	16.66	Adjusted Chi Square Value (27.65, β)	15.28
95% Gamma Approximate UCL (use when n>=50)	0.148	95% Gamma Adjusted UCL (use when n<50)	0.161

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0921	SD (KM)	0.0757
Variance (KM)	0.00573	SE of Mean (KM)	0.0256
k hat (KM)	1.481	k star (KM)	1.138
nu hat (KM)	32.58	nu star (KM)	25.03
theta hat (KM)	0.0622	theta star (KM)	0.081
80% gamma percentile (KM)	0.147	90% gamma percentile (KM)	0.206

On-Project Blue Beach Area Shallow Groundwater

95% gamma percentile (KM)	0.264	99% gamma percentile (KM)	0.398

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (25.03, α)	14.63	Adjusted Chi Square Value (25.03, β)	13.35
95% Gamma Approximate KM-UCL (use when n>=50)	0.158	95% Gamma Adjusted KM-UCL (use when n<50)	0.173

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.836	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.238	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0933	Mean in Log Scale	-2.607
SD in Original Scale	0.0792	SD in Log Scale	0.657
95% t UCL (assumes normality of ROS data)	0.137	95% Percentile Bootstrap UCL	0.133
95% BCA Bootstrap UCL	0.148	95% Bootstrap t UCL	0.263
95% H-UCL (Log ROS)	0.151		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.615	KM Geo Mean	0.0731
KM SD (logged)	0.609	95% Critical H Value (KM-Log)	2.326
KM Standard Error of Mean (logged)	0.206	95% H-UCL (KM -Log)	0.138
KM SD (logged)	0.609	95% Critical H Value (KM-Log)	2.326
KM Standard Error of Mean (logged)	0.206		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0894	Mean in Log Scale	-2.668
SD in Original Scale	0.0808	SD in Log Scale	0.666
95% t UCL (Assumes normality)	0.134	95% H-Stat UCL	0.144

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.138

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_SVOCs-SIM|Benzo(a)Pyrene|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	6
		Number of Missing Observations	2
Number of Detects	4	Number of Non-Detects	7
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.0745	Minimum Non-Detect	0.093
Maximum Detect	0.22	Maximum Non-Detect	0.098
Variance Detects	0.00625	Percent Non-Detects	63.64%
Mean Detects	0.152	SD Detects	0.079
Median Detects	0.157	CV Detects	0.52
Skewness Detects	-0.0472	Kurtosis Detects	-5.728
Mean of Logged Detects	-2	SD of Logged Detects	0.568

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.785	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.306	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.106	KM Standard Error of Mean	0.0193
KM SD	0.0543	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.141	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.138	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.164	95% KM Chebyshev UCL	0.19
97.5% KM Chebyshev UCL	0.227	99% KM Chebyshev UCL	0.298

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.567	Anderson-Darling GOF Test	
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.339	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	4.493	k star (bias corrected MLE)	1.29
Theta hat (MLE)	0.0338	Theta star (bias corrected MLE)	0.118
nu hat (MLE)	35.94	nu star (bias corrected)	10.32
Mean (detects)	0.152		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0481	Mean	0.105
Maximum	0.22	Median	0.0814
SD	0.0601	CV	0.571
k hat (MLE)	4.258	k star (bias corrected MLE)	3.157
Theta hat (MLE)	0.0247	Theta star (bias corrected MLE)	0.0333
nu hat (MLE)	93.67	nu star (bias corrected)	69.46
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (69.46, α)	51.27	Adjusted Chi Square Value (69.46, β)	48.73
95% Gamma Approximate UCL (use when n>=50)	0.143	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.106	SD (KM)	0.0543
Variance (KM)	0.00295	SE of Mean (KM)	0.0193
k hat (KM)	3.809	k star (KM)	2.83
nu hat (KM)	83.79	nu star (KM)	62.27
theta hat (KM)	0.0278	theta star (KM)	0.0375
80% gamma percentile (KM)	0.152	90% gamma percentile (KM)	0.19

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95% gamma percentile (KM)	0.226	99% gamma percentile (KM)	0.304

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (62.27, α)	45.12	Adjusted Chi Square Value (62.27, β)	42.75
95% Gamma Approximate KM-UCL (use when n>=50)	0.146	95% Gamma Adjusted KM-UCL (use when n<50)	0.154

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.815	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.304	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.107	Mean in Log Scale	-2.337
SD in Original Scale	0.0579	SD in Log Scale	0.447
95% t UCL (assumes normality of ROS data)	0.139	95% Percentile Bootstrap UCL	0.136
95% BCA Bootstrap UCL	0.146	95% Bootstrap t UCL	0.197
95% H-UCL (Log ROS)	0.144		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.34	KM Geo Mean	0.0964
KM SD (logged)	0.4	95% Critical H Value (KM-Log)	2.055
KM Standard Error of Mean (logged)	0.147	95% H-UCL (KM -Log)	0.135
KM SD (logged)	0.4	95% Critical H Value (KM-Log)	2.055
KM Standard Error of Mean (logged)	0.147		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0855	Mean in Log Scale	-2.666
SD in Original Scale	0.0682	SD in Log Scale	0.613
95% t UCL (Assumes normality)	0.123	95% H-Stat UCL	0.132

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.141

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_SVOCs-SIM|Benzo(b)fluoranthene|ug/l

General Statistics			
Total Number of Observations	11	Number of Distinct Observations	7
		Number of Missing Observations	2
Number of Detects	4	Number of Non-Detects	7
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.095	Minimum Non-Detect	0.093
Maximum Detect	0.38	Maximum Non-Detect	0.098
Variance Detects	0.0135	Percent Non-Detects	63.64%
Mean Detects	0.239	SD Detects	0.116
Median Detects	0.24	CV Detects	0.487
Skewness Detects	-0.0644	Kurtosis Detects	1.502
Mean of Logged Detects	-1.544	SD of Logged Detects	0.582

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.944	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.254	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.146	KM Standard Error of Mean	0.0323
KM SD	0.0927	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.205	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.199	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.243	95% KM Chebyshev UCL	0.287
97.5% KM Chebyshev UCL	0.348	99% KM Chebyshev UCL	0.467

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.376	Anderson-Darling GOF Test	
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.316	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	4.641	k star (bias corrected MLE)	1.327
Theta hat (MLE)	0.0514	Theta star (bias corrected MLE)	0.18
nu hat (MLE)	37.13	nu star (bias corrected)	10.62
Mean (detects)	0.239		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.0932
Maximum	0.38	Median	0.01
SD	0.132	CV	1.415
k hat (MLE)	0.558	k star (bias corrected MLE)	0.467
Theta hat (MLE)	0.167	Theta star (bias corrected MLE)	0.2
nu hat (MLE)	12.28	nu star (bias corrected)	10.27
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (10.27, α)	4.108	Adjusted Chi Square Value (10.27, β)	3.496
95% Gamma Approximate UCL (use when n>=50)	0.233	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.146	SD (KM)	0.0927
Variance (KM)	0.0086	SE of Mean (KM)	0.0323
k hat (KM)	2.48	k star (KM)	1.864
nu hat (KM)	54.56	nu star (KM)	41.01
theta hat (KM)	0.0589	theta star (KM)	0.0783
80% gamma percentile (KM)	0.22	90% gamma percentile (KM)	0.289

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95% gamma percentile (KM)	0.354	99% gamma percentile (KM)	0.5

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (41.01, α)	27.34	Adjusted Chi Square Value (41.01, β)	25.53
95% Gamma Approximate KM-UCL (use when n>=50)	0.219	95% Gamma Adjusted KM-UCL (use when n<50)	0.235

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.894	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.33	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.111	Mean in Log Scale	-2.679
SD in Original Scale	0.12	SD in Log Scale	1.005
95% t UCL (assumes normality of ROS data)	0.177	95% Percentile Bootstrap UCL	0.171
95% BCA Bootstrap UCL	0.189	95% Bootstrap t UCL	0.216
95% H-UCL (Log ROS)	0.296		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.072	KM Geo Mean	0.126
KM SD (logged)	0.502	95% Critical H Value (KM-Log)	2.178
KM Standard Error of Mean (logged)	0.175	95% H-UCL (KM -Log)	0.202
KM SD (logged)	0.502	95% Critical H Value (KM-Log)	2.178
KM Standard Error of Mean (logged)	0.175		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.117	Mean in Log Scale	-2.503
SD in Original Scale	0.116	SD in Log Scale	0.825
95% t UCL (Assumes normality)	0.18	95% H-Stat UCL	0.231

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.205

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_SVOCs-SIM|Naphthalene|ug/l

General Statistics

Total Number of Observations	11	Number of Distinct Observations	7
		Number of Missing Observations	2
Number of Detects	3	Number of Non-Detects	8
Number of Distinct Detects	3	Number of Distinct Non-Detects	4
Minimum Detect	0.092	Minimum Non-Detect	0.093
Maximum Detect	250	Maximum Non-Detect	0.098
Variance Detects	16021	Percent Non-Detects	72.73%
Mean Detects	136.7	SD Detects	126.6
Median Detects	160	CV Detects	0.926
Skewness Detects	-0.8	Kurtosis Detects	N/A
Mean of Logged Detects	2.737	SD of Logged Detects	4.442

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.975	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.24	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	37.35	KM Standard Error of Mean	30.03
KM SD	81.33	95% KM (BCA) UCL	N/A
95% KM (t) UCL	91.78	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	86.75	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	127.4	95% KM Chebyshev UCL	168.3
97.5% KM Chebyshev UCL	224.9	99% KM Chebyshev UCL	336.2

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.314	k star (bias corrected MLE)	N/A
Theta hat (MLE)	435.5	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	1.883	nu star (bias corrected)	N/A
Mean (detects)	136.7		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	43.08
Maximum	250	Median	2.022
SD	83.05	CV	1.928
k hat (MLE)	0.218	k star (bias corrected MLE)	0.219
Theta hat (MLE)	198	Theta star (bias corrected MLE)	196.9
nu hat (MLE)	4.786	nu star (bias corrected)	4.814
Adjusted Level of Significance (β)	0.0278		
Approximate Chi Square Value (4.81, α)	1.067	Adjusted Chi Square Value (4.81, β)	0.812
95% Gamma Approximate UCL (use when n>=50)	194.3	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	37.35	SD (KM)	81.33
Variance (KM)	6614	SE of Mean (KM)	30.03
k hat (KM)	0.211	k star (KM)	0.214
nu hat (KM)	4.64	nu star (KM)	4.708
theta hat (KM)	177.1	theta star (KM)	174.5
80% gamma percentile (KM)	50.89	90% gamma percentile (KM)	112.9

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95% gamma percentile (KM)	189	99% gamma percentile (KM)	396.3

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.71, α)	1.02	Adjusted Chi Square Value (4.71, β)	0.772
95% Gamma Approximate KM-UCL (use when n>=50)	172.4	95% Gamma Adjusted KM-UCL (use when n<50)	227.6

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.792	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.367	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	37.51	Mean in Log Scale	-0.931
SD in Original Scale	85.22	SD in Log Scale	3.463
95% t UCL (assumes normality of ROS data)	84.08	95% Percentile Bootstrap UCL	82.87
95% BCA Bootstrap UCL	97.36	95% Bootstrap t UCL	8529
95% H-UCL (Log ROS)	1914011		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.989	KM Geo Mean	0.372
KM SD (logged)	2.965	95% Critical H Value (KM-Log)	7.407
KM Standard Error of Mean (logged)	1.095	95% H-UCL (KM -Log)	31355
KM SD (logged)	2.965	95% Critical H Value (KM-Log)	7.407
KM Standard Error of Mean (logged)	1.095		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	37.32	Mean in Log Scale	-1.473
SD in Original Scale	85.31	SD in Log Scale	3.355
95% t UCL (Assumes normality)	83.94	95% H-Stat UCL	437242

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	91.78

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_VOCs_VPHs|1,2,4-Trimethylbenzene|ug/l

General Statistics

Total Number of Observations	17	Number of Distinct Observations	6
Number of Detects	3	Number of Non-Detects	14
Number of Distinct Detects	3	Number of Distinct Non-Detects	3
Minimum Detect	0.26	Minimum Non-Detect	0.2
Maximum Detect	320	Maximum Non-Detect	0.5
Variance Detects	33263	Percent Non-Detects	82.35%
Mean Detects	109.5	SD Detects	182.4
Median Detects	8.1	CV Detects	1.666
Skewness Detects	1.728	Kurtosis Detects	N/A
Mean of Logged Detects	2.171	SD of Logged Detects	3.558

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.768	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.377	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	19.48	KM Standard Error of Mean	22.32
KM SD	75.15	95% KM (BCA) UCL	N/A
95% KM (t) UCL	58.46	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	56.2	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	86.45	95% KM Chebyshev UCL	116.8
97.5% KM Chebyshev UCL	158.9	99% KM Chebyshev UCL	241.6

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.277	k star (bias corrected MLE)	N/A
Theta hat (MLE)	395.5	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	1.661	nu star (bias corrected)	N/A
Mean (detects)	109.5		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	19.32
Maximum	320	Median	0.01
SD	77.51	CV	4.011
k hat (MLE)	0.124	k star (bias corrected MLE)	0.141
Theta hat (MLE)	155.9	Theta star (bias corrected MLE)	136.8
nu hat (MLE)	4.214	nu star (bias corrected)	4.804
Adjusted Level of Significance (β)	0.0346		
Approximate Chi Square Value (4.80, α)	1.063	Adjusted Chi Square Value (4.80, β)	0.893
95% Gamma Approximate UCL (use when n>=50)	87.36	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	19.48	SD (KM)	75.15
Variance (KM)	5648	SE of Mean (KM)	22.32
k hat (KM)	0.0672	k star (KM)	0.0946
nu hat (KM)	2.285	nu star (KM)	3.215
theta hat (KM)	289.9	theta star (KM)	206
80% gamma percentile (KM)	12.43	90% gamma percentile (KM)	50.6
95% gamma percentile (KM)	113.4	99% gamma percentile (KM)	318.2

On-Project Blue Beach Area Shallow Groundwater

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (3.22, α)	0.439	Adjusted Chi Square Value (3.22, β)	0.352
95% Gamma Approximate KM-UCL (use when n>=50)	142.7	95% Gamma Adjusted KM-UCL (use when n<50)	178
95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)			

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	1	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.177	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	19.32	Mean in Log Scale	-8.857
SD in Original Scale	77.51	SD in Log Scale	7.013
95% t UCL (assumes normality of ROS data)	52.14	95% Percentile Bootstrap UCL	56.52
95% BCA Bootstrap UCL	94.13	95% Bootstrap t UCL	23365
95% H-UCL (Log ROS)	4.934E+17		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.925	KM Geo Mean	0.397
KM SD (logged)	1.883	95% Critical H Value (KM-Log)	4.172
KM Standard Error of Mean (logged)	0.56	95% H-UCL (KM -Log)	16.67
KM SD (logged)	1.883	95% Critical H Value (KM-Log)	4.172
KM Standard Error of Mean (logged)	0.56		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	19.47	Mean in Log Scale	-1.029
SD in Original Scale	77.47	SD in Log Scale	2.011
95% t UCL (Assumes normality)	52.28	95% H-Stat UCL	24.77
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use
95% KM (t) UCL 58.46

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_VOCs_VPHs|1,2-Dichloropropane|ug/l

General Statistics			
Total Number of Observations	17	Number of Distinct Observations	3
Number of Detects	1	Number of Non-Detects	16
Number of Distinct Detects	1	Number of Distinct Non-Detects	2

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable RA_WG_VOCs_VPHs|1,2-Dichloropropane|ug/l was not processed!

On-Project Blue Beach Area Shallow Groundwater

RA_WG_VOCs_VPHs|cis-1,2-Dichloroethene|ug/l

General Statistics

Total Number of Observations	17	Number of Distinct Observations	7
Number of Detects	6	Number of Non-Detects	11
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	0.72	Minimum Non-Detect	0.25
Maximum Detect	8.4	Maximum Non-Detect	0.5
Variance Detects	9.771	Percent Non-Detects	64.71%
Mean Detects	3.132	SD Detects	3.126
Median Detects	1.7	CV Detects	0.998
Skewness Detects	1.242	Kurtosis Detects	0.166
Mean of Logged Detects	0.717	SD of Logged Detects	1.009

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.804	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.343	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.267	KM Standard Error of Mean	0.58
KM SD	2.184	95% KM (BCA) UCL	2.342
95% KM (t) UCL	2.28	95% KM (Percentile Bootstrap) UCL	2.284
95% KM (z) UCL	2.222	95% KM Bootstrap t UCL	4.009
90% KM Chebyshev UCL	3.008	95% KM Chebyshev UCL	3.796
97.5% KM Chebyshev UCL	4.891	99% KM Chebyshev UCL	7.041

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.471	Anderson-Darling GOF Test	
5% A-D Critical Value	0.71	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.297	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.339	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.321	k star (bias corrected MLE)	0.771
Theta hat (MLE)	2.371	Theta star (bias corrected MLE)	4.06
nu hat (MLE)	15.85	nu star (bias corrected)	9.257
Mean (detects)	3.132		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.112
Maximum	8.4	Median	0.01
SD	2.328	CV	2.094
k hat (MLE)	0.251	k star (bias corrected MLE)	0.246
Theta hat (MLE)	4.435	Theta star (bias corrected MLE)	4.526
nu hat (MLE)	8.522	nu star (bias corrected)	8.352
Adjusted Level of Significance (β)	0.0346		
Approximate Chi Square Value (8.35, α)	2.94	Adjusted Chi Square Value (8.35, β)	2.614
95% Gamma Approximate UCL (use when n>=50)	3.158	95% Gamma Adjusted UCL (use when n<50)	3.553

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.267	SD (KM)	2.184
Variance (KM)	4.77	SE of Mean (KM)	0.58
k hat (KM)	0.337	k star (KM)	0.316
nu hat (KM)	11.44	nu star (KM)	10.76
theta hat (KM)	3.765	theta star (KM)	4.005
80% gamma percentile (KM)	1.967	90% gamma percentile (KM)	3.712
95% gamma percentile (KM)	5.697	99% gamma percentile (KM)	10.82

On-Project Blue Beach Area Shallow Groundwater

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (10.76, α)	4.42	Adjusted Chi Square Value (10.76, β)	4.002
95% Gamma Approximate KM-UCL (use when n>=50)	3.084	95% Gamma Adjusted KM-UCL (use when n<50)	3.405
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.893	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.24	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	1.169	Mean in Log Scale	-1.604
SD in Original Scale	2.3	SD in Log Scale	2.099
95% t UCL (assumes normality of ROS data)	2.143	95% Percentile Bootstrap UCL	2.175
95% BCA Bootstrap UCL	2.465	95% Bootstrap t UCL	4.503
95% H-UCL (Log ROS)	20.05		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.644	KM Geo Mean	0.525
KM SD (logged)	1.145	95% Critical H Value (KM-Log)	2.891
KM Standard Error of Mean (logged)	0.304	95% H-UCL (KM -Log)	2.313
KM SD (logged)	1.145	95% Critical H Value (KM-Log)	2.891
KM Standard Error of Mean (logged)	0.304		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.252	Mean in Log Scale	-0.725
SD in Original Scale	2.259	SD in Log Scale	1.254
95% t UCL (Assumes normality)	2.209	95% H-Stat UCL	2.784
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Approximate Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	2.28		

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_VOCs_VPHs|Ethylbenzene|ug/l

General Statistics

Total Number of Observations	17	Number of Distinct Observations	5
Number of Detects	2	Number of Non-Detects	15
Number of Distinct Detects	2	Number of Distinct Non-Detects	3
Minimum Detect	4.3	Minimum Non-Detect	0.2
Maximum Detect	4.8	Maximum Non-Detect	0.5
Variance Detects	0.125	Percent Non-Detects	88.24%
Mean Detects	4.55	SD Detects	0.354
Median Detects	4.55	CV Detects	0.0777
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	1.514	SD of Logged Detects	0.0778

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.712	KM Standard Error of Mean	0.482
KM SD	1.404	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.553	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.504	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	2.157	95% KM Chebyshev UCL	2.811
97.5% KM Chebyshev UCL	3.719	99% KM Chebyshev UCL	5.504

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	330.9	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0138	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	1324	nu star (bias corrected)	N/A
Mean (detects)	4.55		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.712	SD (KM)	1.404
Variance (KM)	1.972	SE of Mean (KM)	0.482
k hat (KM)	0.257	k star (KM)	0.251
nu hat (KM)	8.736	nu star (KM)	8.528
theta hat (KM)	2.77	theta star (KM)	2.838
80% gamma percentile (KM)	1.035	90% gamma percentile (KM)	2.136
95% gamma percentile (KM)	3.442	99% gamma percentile (KM)	6.917

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0346
Approximate Chi Square Value (8.53, α)	3.044	Adjusted Chi Square Value (8.53, β)	2.711
95% Gamma Approximate KM-UCL (use when n>=50)	1.994	95% Gamma Adjusted KM-UCL (use when n<50)	2.239

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.855	Mean in Log Scale	1.015
SD in Original Scale	0.804	SD in Log Scale	0.266
95% t UCL (assumes normality of ROS data)	3.196	95% Percentile Bootstrap UCL	3.194
95% BCA Bootstrap UCL	3.224	95% Bootstrap t UCL	3.267
95% H-UCL (Log ROS)	3.229		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.242	KM Geo Mean	0.289
KM SD (logged)	1.006	95% Critical H Value (KM-Log)	2.679
KM Standard Error of Mean (logged)	0.345	95% H-UCL (KM -Log)	0.94

On-Project Blue Beach Area Shallow Groundwater

KM SD (logged)	1.006	95% Critical H Value (KM-Log)	2.679
KM Standard Error of Mean (logged)	0.345		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.709	Mean in Log Scale	-1.316
SD in Original Scale	1.45	SD in Log Scale	1.128
95% t UCL (Assumes normality)	1.323	95% H-Stat UCL	1.136

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.553	KM H-UCL	0.94
95% KM (BCA) UCL	N/A		

Warning: One or more Recommended UCL(s) not available!

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Shallow Groundwater

RA_WG_VOCs_VPHs|Total Xylenes|ug/l

General Statistics			
Total Number of Observations	17	Number of Distinct Observations	4
Number of Detects	1	Number of Non-Detects	16
Number of Distinct Detects	1	Number of Distinct Non-Detects	3

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable RA_WG_VOCs_VPHs|Total Xylenes|ug/l was not processed!

On-Project Blue Beach Area Shallow Groundwater

RA_WG_VOCs_VPHs|Trichloroethylene|ug/l

General Statistics

Total Number of Observations	17	Number of Distinct Observations	8
Number of Detects	7	Number of Non-Detects	10
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	1.4	Minimum Non-Detect	0.25
Maximum Detect	75	Maximum Non-Detect	0.5
Variance Detects	1086	Percent Non-Detects	58.82%
Mean Detects	32.73	SD Detects	32.96
Median Detects	28	CV Detects	1.007
Skewness Detects	0.398	Kurtosis Detects	-1.919
Mean of Logged Detects	2.521	SD of Logged Detects	1.829

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.837	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.243	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	13.62	KM Standard Error of Mean	6.622
KM SD	25.28	95% KM (BCA) UCL	24.79
95% KM (t) UCL	25.18	95% KM (Percentile Bootstrap) UCL	24.28
95% KM (z) UCL	24.52	95% KM Bootstrap t UCL	27
90% KM Chebyshev UCL	33.49	95% KM Chebyshev UCL	42.49
97.5% KM Chebyshev UCL	54.98	99% KM Chebyshev UCL	79.51

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.574	Anderson-Darling GOF Test	
5% A-D Critical Value	0.743	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.238	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.325	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.634	k star (bias corrected MLE)	0.457
Theta hat (MLE)	51.63	Theta star (bias corrected MLE)	71.54
nu hat (MLE)	8.875	nu star (bias corrected)	6.405
Mean (detects)	32.73		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	13.48
Maximum	75	Median	0.01
SD	26.13	CV	1.938
k hat (MLE)	0.176	k star (bias corrected MLE)	0.184
Theta hat (MLE)	76.72	Theta star (bias corrected MLE)	73.3
nu hat (MLE)	5.975	nu star (bias corrected)	6.254
Adjusted Level of Significance (β)	0.0346		
Approximate Chi Square Value (6.25, α)	1.771	Adjusted Chi Square Value (6.25, β)	1.533
95% Gamma Approximate UCL (use when n>=50)	47.61	95% Gamma Adjusted UCL (use when n<50)	54.99

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	13.62	SD (KM)	25.28
Variance (KM)	638.9	SE of Mean (KM)	6.622
k hat (KM)	0.291	k star (KM)	0.278
nu hat (KM)	9.877	nu star (KM)	9.467
theta hat (KM)	46.9	theta star (KM)	48.93
80% gamma percentile (KM)	20.48	90% gamma percentile (KM)	40.51
95% gamma percentile (KM)	63.81	99% gamma percentile (KM)	124.9

On-Project Blue Beach Area Shallow Groundwater

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (9.47, α)	3.612	Adjusted Chi Square Value (9.47, β)	3.241
95% Gamma Approximate KM-UCL (use when n>=50)	35.71	95% Gamma Adjusted KM-UCL (use when n<50)	39.79
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.818	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.243	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	13.56	Mean in Log Scale	-0.737
SD in Original Scale	26.09	SD in Log Scale	3.337
95% t UCL (assumes normality of ROS data)	24.61	95% Percentile Bootstrap UCL	24.68
95% BCA Bootstrap UCL	26.5	95% Bootstrap t UCL	33.43
95% H-UCL (Log ROS)	41272		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	0.223	KM Geo Mean	1.249
KM SD (logged)	2.209	95% Critical H Value (KM-Log)	4.776
KM Standard Error of Mean (logged)	0.579	95% H-UCL (KM -Log)	200.4
KM SD (logged)	2.209	95% Critical H Value (KM-Log)	4.776
KM Standard Error of Mean (logged)	0.579		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	13.62	Mean in Log Scale	0.182
SD in Original Scale	26.06	SD in Log Scale	2.314
95% t UCL (Assumes normality)	24.65	95% H-Stat UCL	309.3
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	25.18		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL Input/Output
Off-Project Red Maple Swamp / Tidal Stream Area Sediment

Off-Project Red Maple Swamp/Tidal Stream Area Sediment

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_SE_Pest_PCBs|Total PCB Aroclors|mg/kg	D_RA_SE_Pest_PCBs|Total PCB Aroclors|mg/kg
SE	T	SE-OffProject_RedMapleSwamp	SED 3	11/30/2011 12:00 AM	0 - 0.5 ft	0.69	0
SE	T	SE-OffProject_RedMapleSwamp	SED 4	11/29/2011 12:00 AM	0 - 0.5 ft	0.63	1
SE	T	SE-OffProject_RedMapleSwamp	SED 5	11/29/2011 12:00 AM	0 - 0.5 ft	0.41	1
SE	T	SE-OffProject_RedMapleSwamp	SED-103-2014	8/5/2014 12:00 AM	0 - 0.5 ft		
SE	T	SE-OffProject_RedMapleSwamp	SED-104-2014	8/5/2014 12:00 AM	0 - 0.5 ft		
SE	T	SE-OffProject_RedMapleSwamp	SED-105-2014	8/5/2014 12:00 AM	0 - 0.5 ft		
SE	T	SE-OffProject_RedMapleSwamp	SED-326	10/1/2019 1:50 PM	0 - 0.5 ft	0.072	0
SE	T	SE-OffProject_RedMapleSwamp	SED-327	10/1/2019 2:15 PM	0 - 0.5 ft	0.066	0
SE	T	SE-OffProject_RedMapleSwamp	SED-328	10/1/2019 2:45 PM	0 - 0.5 ft	0.39	0
SE	T	SE-OffProject_RedMapleSwamp	SED-329	10/1/2019 3:05 PM	0 - 0.5 ft	0.087	0
SE	T	SE-OffProject_RedMapleSwamp	SED-330	10/1/2019 3:30 PM	0 - 0.5 ft	0.084	1
SE	T	SE-OffProject_RedMapleSwamp	SED-331	10/2/2019 2:30 PM	0 - 0.5 ft	0.49	0
SE	T	SE-OffProject_RedMapleSwamp	SED-331	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	T	SE-OffProject_RedMapleSwamp	SED-332	10/2/2019 2:00 PM	0 - 0.5 ft	0.52	0
SE	T	SE-OffProject_RedMapleSwamp	SED-333	10/2/2019 1:30 PM	0 - 0.5 ft	0.16	0
SE	T	SE-OffProject_RedMapleSwamp	SED-333	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	T	SE-OffProject_RedMapleSwamp	SED-334	10/2/2019 1:00 PM	0 - 0.5 ft	0.37	1
SE	T	SE-OffProject_RedMapleSwamp	SED-335	10/2/2019 12:30 PM	0 - 0.5 ft	1.5	1
SE	T	SE-OffProject_RedMapleSwamp	SED-335	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	T	SE-OffProject_RedMapleSwamp	SED-336	10/2/2019 10:10 AM	0 - 0.5 ft	0.48	1
SE	T	SE-OffProject_RedMapleSwamp	SED-337	10/2/2019 9:30 AM	0 - 0.5 ft	0.27	1
SE	T	SE-OffProject_RedMapleSwamp	SED-337	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	T	SE-OffProject_RedMapleSwamp	SED-338	10/2/2019 10:00 AM	0 - 0.5 ft	0.23	1
SE	T	SE-OffProject_RedMapleSwamp	SED-339	10/2/2019 9:20 AM	0 - 0.5 ft	0.1	1
SE	T	SE-OffProject_RedMapleSwamp	SED-339	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	T	SE-OffProject_RedMapleSwamp	SED-340	10/2/2019 8:45 AM	0 - 0.5 ft	0.12	1

Off-Project Red Maple Swamp/Tidal Stream Area Sediment

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/29/2020 4:07:43 PM
From File	Input_SE_RMS.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_SE_Pest_PCBs|Total PCB Aroclors|mg/kg

General Statistics

Total Number of Observations	18	Number of Distinct Observations	18
		Number of Missing Observations	8
Number of Detects	10	Number of Non-Detects	8
Number of Distinct Detects	10	Number of Distinct Non-Detects	8
Minimum Detect	0.084	Minimum Non-Detect	0.066
Maximum Detect	1.5	Maximum Non-Detect	0.69
Variance Detects	0.176	Percent Non-Detects	44.44%
Mean Detects	0.419	SD Detects	0.419
Median Detects	0.32	CV Detects	0.999
Skewness Detects	2.197	Kurtosis Detects	5.556
Mean of Logged Detects	-1.236	SD of Logged Detects	0.897

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.752	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.243	Lilliefors GOF Test
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.291	KM Standard Error of Mean	0.0862
KM SD	0.339	95% KM (BCA) UCL	0.442
95% KM (t) UCL	0.441	95% KM (Percentile Bootstrap) UCL	0.439
95% KM (z) UCL	0.433	95% KM Bootstrap t UCL	0.562
90% KM Chebyshev UCL	0.549	95% KM Chebyshev UCL	0.667
97.5% KM Chebyshev UCL	0.829	99% KM Chebyshev UCL	1.149

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.299	Anderson-Darling GOF Test
5% A-D Critical Value	0.739	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.137	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.271	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.509	k star (bias corrected MLE)	1.123
Theta hat (MLE)	0.278	Theta star (bias corrected MLE)	0.373
nu hat (MLE)	30.18	nu star (bias corrected)	22.46
Mean (detects)	0.419		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.253
Maximum	1.5	Median	0.106
SD	0.361	CV	1.427
k hat (MLE)	0.664	k star (bias corrected MLE)	0.59
Theta hat (MLE)	0.381	Theta star (bias corrected MLE)	0.429
nu hat (MLE)	23.9	nu star (bias corrected)	21.25
Adjusted Level of Significance (β)	0.0357		
Approximate Chi Square Value (21.25, α)	11.78	Adjusted Chi Square Value (21.25, β)	11.11

Off-Project Red Maple Swamp/Tidal Stream Area Sediment

95% Gamma Approximate UCL (use when n>=50)	0.456	95% Gamma Adjusted UCL (use when n<50)	0.484

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.291	SD (KM)	0.339
Variance (KM)	0.115	SE of Mean (KM)	0.0862
k hat (KM)	0.737	k star (KM)	0.651
nu hat (KM)	26.53	nu star (KM)	23.44
theta hat (KM)	0.395	theta star (KM)	0.447
80% gamma percentile (KM)	0.479	90% gamma percentile (KM)	0.742
95% gamma percentile (KM)	1.016	99% gamma percentile (KM)	1.673

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (23.44, α)	13.42	Adjusted Chi Square Value (23.44, β)	12.7
95% Gamma Approximate KM-UCL (use when n>=50)	0.508	95% Gamma Adjusted KM-UCL (use when n<50)	0.537

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.962	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.138	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.273	Mean in Log Scale	-1.809
SD in Original Scale	0.349	SD in Log Scale	0.993
95% t UCL (assumes normality of ROS data)	0.417	95% Percentile Bootstrap UCL	0.42
95% BCA Bootstrap UCL	0.479	95% Bootstrap t UCL	0.574
95% H-UCL (Log ROS)	0.506		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.707	KM Geo Mean	0.181
KM SD (logged)	0.926	95% Critical H Value (KM-Log)	2.531
KM Standard Error of Mean (logged)	0.25	95% H-UCL (KM -Log)	0.491
KM SD (logged)	0.926	95% Critical H Value (KM-Log)	2.531
KM Standard Error of Mean (logged)	0.25		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.302	Mean in Log Scale	-1.678
SD in Original Scale	0.343	SD in Log Scale	1.038
95% t UCL (Assumes normality)	0.442	95% H-Stat UCL	0.631

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.441

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Attachment B-2

Ecological Risk Assessment ProUCL Input/Output

ProUCL Input/Output
On-Project Blue Beach Area Surface Soil

On-Project Blue Beach Area Surface Soil

Matrix	Soil	Location	Collected	Depth	RA_SO_Metals|Antimony|mg/kg	D_RA_SO_Metals|Antimony|mg/kg	RA_SO_Metals|Cadmium|mg/kg	D_RA_SO_Metals|Cadmium|mg/kg
SO	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:25 AM	0 - 1 ft	0.092	1	2.66	1
SO	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:15 AM	0 - 1 ft	0.4	1	1.16	1
SO	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:05 AM	0 - 1 ft	0.097	1	0.16	1
SO	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:00 AM	0 - 1 ft	0.14	1	0.747	1
SO	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:10 AM	0 - 1 ft	0.312	1	1.26	1
SO	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:20 AM	0 - 1 ft	0.264	1	0.565	1
SO	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:00 AM	0 - 1 ft	0.07	1	0.227	1
SO	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:20 AM	0 - 1 ft	1.12	1	0.356	1
SO	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:40 AM	0 - 1 ft	0.058	1	1.23	1
SO	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:10 AM	0 - 1 ft	0.11	1	0.73	1
SO	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:30 AM	0 - 1 ft	0.133	1	1.12	1
SO	SO-OnProject_BlueBeach	SB-312	10/7/2019 10:55 AM	0 - 1 ft	0.098	1	0.173	1
SO	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:15 AM	0 - 1 ft	0.07	1	0.263	1
SO	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:40 AM	0 - 1 ft	0.072	1	0.292	1
SO	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:00 PM	0 - 1 ft	0.097	1	0.181	1
SO	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:05 PM	0 - 1 ft	0.06	1	0.016	1
SO	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:20 PM	0 - 1 ft	0.12	1	0.161	1
SO	SO-OnProject_BlueBeach	SB-318	10/7/2019 1:55 PM	0 - 1 ft	0.052	1	0.0885	1
SO	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:30 PM	0 - 1 ft	0.079	1	0.171	1
SO	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:45 PM	0 - 1 ft	0.172	1	0.565	1
SO	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:40 PM	0 - 1 ft	0.447	1	0.292	1
SO	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:35 PM	0 - 1 ft	0.197	1	1.13	1
SO	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:50 PM	0 - 1 ft	0.028	1	0.083	1
SO	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:20 PM	0 - 1 ft	0.046	1	0.0849	1
SO	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:00 PM	0 - 1 ft	0.185	1	0.496	1
SO	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:10 PM	0 - 1 ft	0.04	1	0.016	0
SO	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:30 AM	0 - 1 ft	3.14	1	12	1

On-Project Blue Beach Area Surface Soil

Matrix	Soil	Location	Collected	Depth	RA_SO_Metals|Copper|mg/kg	D_RA_SO_Metals|Copper|mg/kg	RA_SO_Metals|Lead|mg/kg	D_RA_SO_Metals|Lead|mg/kg
SO	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:25 AM	0 - 1 ft	9.4	1	111	1
SO	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:15 AM	0 - 1 ft	31.1	1	383	1
SO	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:05 AM	0 - 1 ft	11.4	1	51.8	1
SO	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:00 AM	0 - 1 ft	16.9	1	22.1	1
SO	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:10 AM	0 - 1 ft	25.2	1	27.8	1
SO	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:20 AM	0 - 1 ft	16.8	1	32.7	1
SO	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:00 AM	0 - 1 ft	6.04	1	70	1
SO	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:20 AM	0 - 1 ft	8.98	1	55.3	1
SO	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:40 AM	0 - 1 ft	7.74	1	12.8	1
SO	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:10 AM	0 - 1 ft	8.5	1	12.7	1
SO	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:30 AM	0 - 1 ft	9.84	1	43.1	1
SO	SO-OnProject_BlueBeach	SB-312	10/7/2019 10:55 AM	0 - 1 ft	9.43	1	52.7	1
SO	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:15 AM	0 - 1 ft	5.5	1	219	1
SO	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:40 AM	0 - 1 ft	10.4	1	55.1	1
SO	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:00 PM	0 - 1 ft	9.82	1	67.9	1
SO	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:05 PM	0 - 1 ft	9.42	1	7.1	1
SO	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:20 PM	0 - 1 ft	8.49	1	30.8	1
SO	SO-OnProject_BlueBeach	SB-318	10/7/2019 1:55 PM	0 - 1 ft	5.09	1	13	1
SO	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:30 PM	0 - 1 ft	5.09	1	18.5	1
SO	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:45 PM	0 - 1 ft	8.96	1	41.1	1
SO	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:40 PM	0 - 1 ft	116	1	159	1
SO	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:35 PM	0 - 1 ft	8.72	1	128	1
SO	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:50 PM	0 - 1 ft	4.35	1	7.17	1
SO	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:20 PM	0 - 1 ft	2.99	1	11.8	1
SO	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:00 PM	0 - 1 ft	24.3	1	51	1
SO	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:10 PM	0 - 1 ft	8.58	1	7.33	1
SO	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:30 AM	0 - 1 ft	85.5	1	243	1

On-Project Blue Beach Area Surface Soil

Matrix	Soil	Location	Collected	Depth	RA_SO_Metals|Selenium|mg/kg	D_RA_SO_Metals|Selenium|mg/kg	RA_SO_Metals|Zinc|mg/kg	D_RA_SO_Metals|Zinc|mg/kg
SO	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:25 AM	0 - 1 ft	0.105	1	42.5	1
SO	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:15 AM	0 - 1 ft	0.08	1	45.1	1
SO	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:05 AM	0 - 1 ft	0.2	1	53.4	1
SO	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:00 AM	0 - 1 ft	0.12	1	48.4	1
SO	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:10 AM	0 - 1 ft	0.1	1	57.4	1
SO	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:20 AM	0 - 1 ft	0.12	1	50.2	1
SO	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:00 AM	0 - 1 ft	0.094	1	28.4	1
SO	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:20 AM	0 - 1 ft	0.1	1	36.5	1
SO	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:40 AM	0 - 1 ft	0.13	1	93.8	1
SO	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:10 AM	0 - 1 ft	0.46	1	42.3	1
SO	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:30 AM	0 - 1 ft	0.12	1	59.6	1
SO	SO-OnProject_BlueBeach	SB-312	10/7/2019 10:55 AM	0 - 1 ft	0.19	1	49.6	1
SO	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:15 AM	0 - 1 ft	0.099	1	75.6	1
SO	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:40 AM	0 - 1 ft	0.14	1	54	1
SO	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:00 PM	0 - 1 ft	0.254	1	35.3	1
SO	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:05 PM	0 - 1 ft	0.408	1	33.5	1
SO	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:20 PM	0 - 1 ft	0.22	1	32.7	1
SO	SO-OnProject_BlueBeach	SB-318	10/7/2019 1:55 PM	0 - 1 ft	0.23	1	29.4	1
SO	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:30 PM	0 - 1 ft	0.396	1	30.2	1
SO	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:45 PM	0 - 1 ft	0.18	1	40.8	1
SO	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:40 PM	0 - 1 ft	0.28	1	425	1
SO	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:35 PM	0 - 1 ft	0.11	1	36.1	1
SO	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:50 PM	0 - 1 ft	0.18	1	30.4	1
SO	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:20 PM	0 - 1 ft	0.37	1	26.5	1
SO	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:00 PM	0 - 1 ft	0.14	1	46.1	1
SO	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:10 PM	0 - 1 ft	0.26	1	29.7	1
SO	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:30 AM	0 - 1 ft	0.17	1	287	1

On-Project Blue Beach Area Surface Soil

Matrix	Soil	Location	Collected	Depth	RA_SO_SVOCs_EPHs|Bis-(2-Ethylhexyl)-Phthalate|mg/kg	D_RA_SO_SVOCs_EPHs|Bis-(2-Ethylhexyl)-Phthalate|mg/kg
SO	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:25 AM	0 - 1 ft	0.25	0
SO	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:15 AM	0 - 1 ft	0.22	1
SO	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:05 AM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:00 AM	0 - 1 ft	0.28	0
SO	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:10 AM	0 - 1 ft	0.2	1
SO	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:20 AM	0 - 1 ft	0.25	0
SO	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:00 AM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:20 AM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:40 AM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:10 AM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:30 AM	0 - 1 ft	0.27	0
SO	SO-OnProject_BlueBeach	SB-312	10/7/2019 10:55 AM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:15 AM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:40 AM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:00 PM	0 - 1 ft	0.15	1
SO	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:05 PM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:20 PM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-318	10/7/2019 1:55 PM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:30 PM	0 - 1 ft	0.24	0
SO	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:45 PM	0 - 1 ft	0.25	0
SO	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:40 PM	0 - 1 ft	0.22	0
SO	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:35 PM	0 - 1 ft	0.24	0
SO	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:50 PM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:20 PM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:00 PM	0 - 1 ft	0.26	0
SO	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:10 PM	0 - 1 ft	0.21	0
SO	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:30 AM	0 - 1 ft	0.86	1

On-Project Blue Beach Area Surface Soil

Matrix	Soil	Location	Collected	Depth	RA_SO_VOCs_VPHs|Acetone|mg/kg	D_RA_SO_VOCs_VPHs|Acetone|mg/kg
SO	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:25 AM	0 - 1 ft		
SO	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:15 AM	0 - 1 ft		
SO	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:05 AM	0 - 1 ft		
SO	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:00 AM	0 - 1 ft		
SO	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:10 AM	0 - 1 ft		
SO	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:20 AM	0 - 1 ft		
SO	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:00 AM	0 - 1 ft	0.012	0
SO	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:20 AM	0 - 1 ft	0.032	1
SO	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:40 AM	0 - 1 ft	0.012	0
SO	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:10 AM	0 - 1 ft	0.019	1
SO	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:30 AM	0 - 1 ft	0.12	1
SO	SO-OnProject_BlueBeach	SB-312	10/7/2019 10:55 AM	0 - 1 ft	0.089	1
SO	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:15 AM	0 - 1 ft	0.011	1
SO	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:40 AM	0 - 1 ft	0.029	1
SO	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:00 PM	0 - 1 ft	0.011	0
SO	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:05 PM	0 - 1 ft	0.011	0
SO	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:20 PM	0 - 1 ft	0.011	0
SO	SO-OnProject_BlueBeach	SB-318	10/7/2019 1:55 PM	0 - 1 ft	0.091	1
SO	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:30 PM	0 - 1 ft	0.0099	0
SO	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:45 PM	0 - 1 ft	0.042	1
SO	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:40 PM	0 - 1 ft	0.014	1
SO	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:35 PM	0 - 1 ft	0.052	1
SO	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:50 PM	0 - 1 ft	0.059	1
SO	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:20 PM	0 - 1 ft	0.39	1
SO	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:00 PM	0 - 1 ft	0.0079	1
SO	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:10 PM	0 - 1 ft	0.012	0
SO	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:30 AM	0 - 1 ft		

On-Project Blue Beach Area Surface Soil

Matrix	Soil	Location	Collected	Depth	RA_SO_Metals|Antimony|mg/kg	D_RA_SO_Metals|Antimony|mg/kg	RA_SO_Metals|Cadmium|mg/kg	D_RA_SO_Metals|Cadmium|mg/kg
SO	SO-OnProject_BlueBeach	SB-301	10/9/2019 9:25 AM	0 - 1 ft	0.092	1	2.66	1
SO	SO-OnProject_BlueBeach	SB-302	10/9/2019 9:15 AM	0 - 1 ft	0.4	1	1.16	1
SO	SO-OnProject_BlueBeach	SB-303	10/9/2019 9:05 AM	0 - 1 ft	0.097	1	0.16	1
SO	SO-OnProject_BlueBeach	SB-304	10/9/2019 11:00 AM	0 - 1 ft	0.14	1	0.747	1
SO	SO-OnProject_BlueBeach	SB-305	10/9/2019 11:10 AM	0 - 1 ft	0.312	1	1.26	1
SO	SO-OnProject_BlueBeach	SB-306	10/9/2019 11:20 AM	0 - 1 ft	0.264	1	0.565	1
SO	SO-OnProject_BlueBeach	SB-307	10/7/2019 9:00 AM	0 - 1 ft	0.07	1	0.227	1
SO	SO-OnProject_BlueBeach	SB-308	10/7/2019 9:20 AM	0 - 1 ft	1.12	1	0.356	1
SO	SO-OnProject_BlueBeach	SB-309	10/7/2019 9:40 AM	0 - 1 ft	0.058	1	1.23	1
SO	SO-OnProject_BlueBeach	SB-310	10/7/2019 10:10 AM	0 - 1 ft	0.11	1	0.73	1
SO	SO-OnProject_BlueBeach	SB-311	10/7/2019 10:30 AM	0 - 1 ft	0.133	1	1.12	1
SO	SO-OnProject_BlueBeach	SB-312	10/7/2019 10:55 AM	0 - 1 ft	0.098	1	0.173	1
SO	SO-OnProject_BlueBeach	SB-313	10/7/2019 11:15 AM	0 - 1 ft	0.07	1	0.263	1
SO	SO-OnProject_BlueBeach	SB-314	10/7/2019 11:40 AM	0 - 1 ft	0.072	1	0.292	1
SO	SO-OnProject_BlueBeach	SB-315	10/7/2019 12:00 PM	0 - 1 ft	0.097	1	0.181	1
SO	SO-OnProject_BlueBeach	SB-316	10/7/2019 2:05 PM	0 - 1 ft	0.06	1	0.016	1
SO	SO-OnProject_BlueBeach	SB-317	10/7/2019 12:20 PM	0 - 1 ft	0.12	1	0.161	1
SO	SO-OnProject_BlueBeach	SB-318	10/7/2019 1:55 PM	0 - 1 ft	0.052	1	0.0885	1
SO	SO-OnProject_BlueBeach	SB-319	10/7/2019 12:30 PM	0 - 1 ft	0.079	1	0.171	1
SO	SO-OnProject_BlueBeach	SB-320	10/7/2019 1:45 PM	0 - 1 ft	0.172	1	0.565	1
SO	SO-OnProject_BlueBeach	SB-321	10/7/2019 12:40 PM	0 - 1 ft	0.447	1	0.292	1
SO	SO-OnProject_BlueBeach	SB-322	10/7/2019 1:35 PM	0 - 1 ft	0.197	1	1.13	1
SO	SO-OnProject_BlueBeach	SB-323	10/7/2019 12:50 PM	0 - 1 ft	0.028	1	0.083	1
SO	SO-OnProject_BlueBeach	SB-324	10/7/2019 1:20 PM	0 - 1 ft	0.046	1	0.0849	1
SO	SO-OnProject_BlueBeach	SB-325	10/7/2019 1:00 PM	0 - 1 ft	0.185	1	0.496	1
SO	SO-OnProject_BlueBeach	SB-326	10/7/2019 1:10 PM	0 - 1 ft	0.04	1	0.016	0
SO	SO-OnProject_BlueBeach	SB-BG-1	10/9/2019 11:30 AM	0 - 1 ft	3.14	1	12	1

On-Project Blue Beach Area Surface Soil

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/30/2020 11:42:36 AM
From File	UCL_Input_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_SO_Metals|Antimony|mg/kg

General Statistics

Total Number of Observations	27	Number of Distinct Observations	25
		Number of Missing Observations	0
Minimum	0.028	Mean	0.285
Maximum	3.14	Median	0.098
SD	0.61	Std. Error of Mean	0.117
Coefficient of Variation	2.14	Skewness	4.329

Normal GOF Test

Shapiro Wilk Test Statistic	0.408	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.923	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.337	Lilliefors GOF Test
5% Lilliefors Critical Value	0.167	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.485	95% Adjusted-CLT UCL (Chen-1995)	0.583
		95% Modified-t UCL (Johnson-1978)	0.502

Gamma GOF Test

A-D Test Statistic	2.519	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.783	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.243	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.175	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.773	k star (bias corrected MLE)	0.712
Theta hat (MLE)	0.369	Theta star (bias corrected MLE)	0.401
nu hat (MLE)	41.75	nu star (bias corrected)	38.45
MLE Mean (bias corrected)	0.285	MLE Sd (bias corrected)	0.338
		Approximate Chi Square Value (0.05)	25.25
Adjusted Level of Significance	0.0401	Adjusted Chi Square Value	24.56

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.434	95% Adjusted Gamma UCL (use when n<50)	0.446

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.905	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.923	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.144	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.167	Data appear Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-3.576	Mean of logged Data	-2.026
Maximum of Logged Data	1.144	SD of logged Data	1.036

Assuming Lognormal Distribution

95% H-UCL	0.38	90% Chebyshev (MVUE) UCL	0.37
95% Chebyshev (MVUE) UCL	0.438	97.5% Chebyshev (MVUE) UCL	0.533
99% Chebyshev (MVUE) UCL	0.719		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

On-Project Blue Beach Area Surface Soil

Nonparametric Distribution Free UCLs			
95% CLT UCL	0.478	95% Jackknife UCL	0.485
95% Standard Bootstrap UCL	0.473	95% Bootstrap-t UCL	1.19
95% Hall's Bootstrap UCL	1.224	95% Percentile Bootstrap UCL	0.497
95% BCA Bootstrap UCL	0.663		
90% Chebyshev(Mean, Sd) UCL	0.638	95% Chebyshev(Mean, Sd) UCL	0.797
97.5% Chebyshev(Mean, Sd) UCL	1.019	99% Chebyshev(Mean, Sd) UCL	1.454

Suggested UCL to Use	
95% H-UCL	0.38

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

On-Project Blue Beach Area Surface Soil

RA_SO_Metals|Cadmium|mg/kg

General Statistics			
Total Number of Observations	27	Number of Distinct Observations	24
Number of Detects	26	Number of Non-Detects	1
Number of Distinct Detects	24	Number of Distinct Non-Detects	1
Minimum Detect	0.016	Minimum Non-Detect	0.016
Maximum Detect	12	Maximum Non-Detect	0.016
Variance Detects	5.367	Percent Non-Detects	3.70%
Mean Detects	1.008	SD Detects	2.317
Median Detects	0.324	CV Detects	2.298
Skewness Detects	4.614	Kurtosis Detects	22.4
Mean of Logged Detects	-0.957	SD of Logged Detects	1.326

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.389	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.92	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.38	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.17	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.971	KM Standard Error of Mean	0.439
KM SD	2.237	95% KM (BCA) UCL	1.822
95% KM (t) UCL	1.72	95% KM (Percentile Bootstrap) UCL	1.784
95% KM (z) UCL	1.694	95% KM Bootstrap t UCL	4.026
90% KM Chebyshev UCL	2.289	95% KM Chebyshev UCL	2.885
97.5% KM Chebyshev UCL	3.713	99% KM Chebyshev UCL	5.34

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.366	Anderson-Darling GOF Test	
5% A-D Critical Value	0.795	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.197	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.18	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.635	k star (bias corrected MLE)	0.587
Theta hat (MLE)	1.588	Theta star (bias corrected MLE)	1.716
nu hat (MLE)	33.02	nu star (bias corrected)	30.54
Mean (detects)	1.008		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.971
Maximum	12	Median	0.292
SD	2.28	CV	2.348
k hat (MLE)	0.584	k star (bias corrected MLE)	0.544
Theta hat (MLE)	1.664	Theta star (bias corrected MLE)	1.787
nu hat (MLE)	31.52	nu star (bias corrected)	29.35
Adjusted Level of Significance (β)	0.0401		
Approximate Chi Square Value (29.35, α)	17.98	Adjusted Chi Square Value (29.35, β)	17.41
95% Gamma Approximate UCL (use when n>=50)	1.585	95% Gamma Adjusted UCL (use when n<50)	1.637

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.971	SD (KM)	2.237
Variance (KM)	5.005	SE of Mean (KM)	0.439
k hat (KM)	0.189	k star (KM)	0.192
nu hat (KM)	10.18	nu star (KM)	10.38
theta hat (KM)	5.152	theta star (KM)	5.052
80% gamma percentile (KM)	1.253	90% gamma percentile (KM)	2.936
95% gamma percentile (KM)	5.056	99% gamma percentile (KM)	10.93

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (10.38, α)	4.182	Adjusted Chi Square Value (10.38, β)	3.933
95% Gamma Approximate KM-UCL (use when n>=50)	2.411	95% Gamma Adjusted KM-UCL (use when n<50)	2.564

On-Project Blue Beach Area Surface Soil

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.971	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.92	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.108	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.17	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.971	Mean in Log Scale	-1.078
SD in Original Scale	2.28	SD in Log Scale	1.443
95% t UCL (assumes normality of ROS data)	1.72	95% Percentile Bootstrap UCL	1.815
95% BCA Bootstrap UCL	2.287	95% Bootstrap t UCL	3.888
95% H-UCL (Log ROS)	2.354		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.075	KM Geo Mean	0.341
KM SD (logged)	1.41	95% Critical H Value (KM-Log)	3.1
KM Standard Error of Mean (logged)	0.277	95% H-UCL (KM -Log)	2.173
KM SD (logged)	1.41	95% Critical H Value (KM-Log)	3.1
KM Standard Error of Mean (logged)	0.277		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.971	Mean in Log Scale	-1.1
SD in Original Scale	2.28	SD in Log Scale	1.498
95% t UCL (Assumes normality)	1.719	95% H-Stat UCL	2.646

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	2.173

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Surface Soil

RA_SO_Metals|Copper|mg/kg

General Statistics

Total Number of Observations	27	Number of Distinct Observations	26
		Number of Missing Observations	0
Minimum	2.99	Mean	17.58
Maximum	116	Median	9.4
SD	25.23	Std. Error of Mean	4.855
Coefficient of Variation	1.435	Skewness	3.232

Normal GOF Test

Shapiro Wilk Test Statistic	0.509	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.923	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.337	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.167	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	25.86	95% Adjusted-CLT UCL (Chen-1995)	28.79
		95% Modified-t UCL (Johnson-1978)	26.36

Gamma GOF Test

A-D Test Statistic	2.707	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.768	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.296	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.172	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.241	k star (bias corrected MLE)	1.128
Theta hat (MLE)	14.16	Theta star (bias corrected MLE)	15.59
nu hat (MLE)	67	nu star (bias corrected)	60.89
MLE Mean (bias corrected)	17.58	MLE Sd (bias corrected)	16.55
		Approximate Chi Square Value (0.05)	43.95
Adjusted Level of Significance	0.0401	Adjusted Chi Square Value	43.03

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	24.35	95% Adjusted Gamma UCL (use when n<50)	24.87

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.866	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.923	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.238	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.167	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	1.095	Mean of logged Data	2.412
Maximum of Logged Data	4.754	SD of logged Data	0.824

Assuming Lognormal Distribution

95% H-UCL	22.73	90% Chebyshev (MVUE) UCL	23.51
95% Chebyshev (MVUE) UCL	27.18	97.5% Chebyshev (MVUE) UCL	32.26
99% Chebyshev (MVUE) UCL	42.26		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	25.56	95% Jackknife UCL	25.86
95% Standard Bootstrap UCL	25.42	95% Bootstrap-t UCL	44.1
95% Hall's Bootstrap UCL	62.31	95% Percentile Bootstrap UCL	26.33
95% BCA Bootstrap UCL	29.44		
90% Chebyshev(Mean, Sd) UCL	32.14	95% Chebyshev(Mean, Sd) UCL	38.74
97.5% Chebyshev(Mean, Sd) UCL	47.89	99% Chebyshev(Mean, Sd) UCL	65.88

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	38.74

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_SO_Metals|Lead|mg/kg

General Statistics

Total Number of Observations	27	Number of Distinct Observations	27
		Number of Missing Observations	0
Minimum	7.1	Mean	71.66
Maximum	383	Median	43.1
SD	87.85	Std. Error of Mean	16.91
Coefficient of Variation	1.226	Skewness	2.274

Normal GOF Test

Shapiro Wilk Test Statistic	0.71	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.923	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.285	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.167	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	100.5	95% Adjusted-CLT UCL (Chen-1995)	107.4
		95% Modified-t UCL (Johnson-1978)	101.7

Gamma GOF Test

A-D Test Statistic	0.662	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.774	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.165	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.173	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.989	k star (bias corrected MLE)	0.904
Theta hat (MLE)	72.42	Theta star (bias corrected MLE)	79.25
nu hat (MLE)	53.43	nu star (bias corrected)	48.83
MLE Mean (bias corrected)	71.66	MLE Sd (bias corrected)	75.36
		Approximate Chi Square Value (0.05)	33.79
Adjusted Level of Significance	0.0401	Adjusted Chi Square Value	32.99

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	103.6	95% Adjusted Gamma UCL (use when n<50)	106.1

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.963	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.923	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.104	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.167	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.96	Mean of logged Data	3.688
Maximum of Logged Data	5.948	SD of logged Data	1.108

Assuming Lognormal Distribution

95% H-UCL	131.8	90% Chebyshev (MVUE) UCL	124.5
95% Chebyshev (MVUE) UCL	148.6	97.5% Chebyshev (MVUE) UCL	182.1
99% Chebyshev (MVUE) UCL	247.8		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	99.47	95% Jackknife UCL	100.5
95% Standard Bootstrap UCL	98.37	95% Bootstrap-t UCL	117.4
95% Hall's Bootstrap UCL	113.3	95% Percentile Bootstrap UCL	102
95% BCA Bootstrap UCL	109.3		
90% Chebyshev(Mean, Sd) UCL	122.4	95% Chebyshev(Mean, Sd) UCL	145.4
97.5% Chebyshev(Mean, Sd) UCL	177.2	99% Chebyshev(Mean, Sd) UCL	239.9

Suggested UCL to Use

95% Adjusted Gamma UCL	106.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_SO_Metals|Selenium|mg/kg

General Statistics

Total Number of Observations	27	Number of Distinct Observations	22
		Number of Missing Observations	0
Minimum	0.08	Mean	0.195
Maximum	0.46	Median	0.17
SD	0.107	Std. Error of Mean	0.0206
Coefficient of Variation	0.55	Skewness	1.18

Normal GOF Test

Shapiro Wilk Test Statistic	0.852	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.923	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.177	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.167	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.23	95% Adjusted-CLT UCL (Chen-1995)	0.234
		95% Modified-t UCL (Johnson-1978)	0.231

Gamma GOF Test

A-D Test Statistic	0.762	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.749	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.159	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.169	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.064	k star (bias corrected MLE)	3.637
Theta hat (MLE)	0.0479	Theta star (bias corrected MLE)	0.0535
nu hat (MLE)	219.5	nu star (bias corrected)	196.4
MLE Mean (bias corrected)	0.195	MLE Sd (bias corrected)	0.102
		Approximate Chi Square Value (0.05)	163
Adjusted Level of Significance	0.0401	Adjusted Chi Square Value	163.1

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	0.232	95% Adjusted Gamma UCL (use when n<50)	0.234

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.939	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.923	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.137	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.167	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.526	Mean of logged Data	-1.765
Maximum of Logged Data	-0.777	SD of logged Data	0.503

Assuming Lognormal Distribution

95% H-UCL	0.236	90% Chebyshev (MVUE) UCL	0.252
95% Chebyshev (MVUE) UCL	0.278	97.5% Chebyshev (MVUE) UCL	0.315
99% Chebyshev (MVUE) UCL	0.388		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.229	95% Jackknife UCL	0.23
95% Standard Bootstrap UCL	0.227	95% Bootstrap-t UCL	0.236
95% Hall's Bootstrap UCL	0.237	95% Percentile Bootstrap UCL	0.229
95% BCA Bootstrap UCL	0.234		
90% Chebyshev(Mean, Sd) UCL	0.256	95% Chebyshev(Mean, Sd) UCL	0.284
97.5% Chebyshev(Mean, Sd) UCL	0.323	99% Chebyshev(Mean, Sd) UCL	0.4

Suggested UCL to Use

95% Adjusted Gamma UCL	0.234

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_SO_Metals|Zinc|mg/kg

General Statistics

Total Number of Observations	27	Number of Distinct Observations	27
		Number of Missing Observations	0
Minimum	26.5	Mean	67.39
Maximum	425	Median	42.5
SD	86.69	Std. Error of Mean	16.68
Coefficient of Variation	1.286	Skewness	3.553

Normal GOF Test

Shapiro Wilk Test Statistic	0.449	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.923	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.388	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.167	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	95.85	95% Adjusted-CLT UCL (Chen-1995)	107
		95% Modified-t UCL (Johnson-1978)	97.75

Gamma GOF Test

A-D Test Statistic	3.692	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.76	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.312	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.171	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.737	k star (bias corrected MLE)	1.569
Theta hat (MLE)	38.79	Theta star (bias corrected MLE)	42.95
nu hat (MLE)	93.82	nu star (bias corrected)	84.73
MLE Mean (bias corrected)	67.39	MLE Sd (bias corrected)	53.8
		Approximate Chi Square Value (0.05)	64.51
Adjusted Level of Significance	0.0401	Adjusted Chi Square Value	63.39

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	88.51	95% Adjusted Gamma UCL (use when n<50)	90.08

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.739	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.923	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.235	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.167	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	3.277	Mean of logged Data	3.896
Maximum of Logged Data	6.052	SD of logged Data	0.645

Assuming Lognormal Distribution

95% H-UCL	79.05	90% Chebyshev (MVUE) UCL	83.88
95% Chebyshev (MVUE) UCL	94.69	97.5% Chebyshev (MVUE) UCL	109.7
99% Chebyshev (MVUE) UCL	139.2		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	94.83	95% Jackknife UCL	95.85
95% Standard Bootstrap UCL	94.56	95% Bootstrap-t UCL	211.7
95% Hall's Bootstrap UCL	226.1	95% Percentile Bootstrap UCL	97.59
95% BCA Bootstrap UCL	111		
90% Chebyshev(Mean, Sd) UCL	117.4	95% Chebyshev(Mean, Sd) UCL	140.1
97.5% Chebyshev(Mean, Sd) UCL	171.6	99% Chebyshev(Mean, Sd) UCL	233.4

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	140.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Surface Soil

RA_SO_SVOCs_EPHs|Bis-(2-Ethylhexyl)-Phthalate|mg/kg

General Statistics			
Total Number of Observations	27	Number of Distinct Observations	10
Number of Detects	4	Number of Non-Detects	23
Number of Distinct Detects	4	Number of Distinct Non-Detects	7
Minimum Detect	0.15	Minimum Non-Detect	0.21
Maximum Detect	0.86	Maximum Non-Detect	0.28
Variance Detects	0.113	Percent Non-Detects	85.19%
Mean Detects	0.358	SD Detects	0.336
Median Detects	0.21	CV Detects	0.941
Skewness Detects	1.954	Kurtosis Detects	3.854
Mean of Logged Detects	-1.293	SD of Logged Detects	0.779

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.711	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.409	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.209	KM Standard Error of Mean	0.0336
KM SD	0.131	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.266	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.264	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.31	95% KM Chebyshev UCL	0.356
97.5% KM Chebyshev UCL	0.419	99% KM Chebyshev UCL	0.544

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.64	Anderson-Darling GOF Test	
5% A-D Critical Value	0.661	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.405	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.398	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected data follow Appr. Gamma Distribution at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	2.043	k star (bias corrected MLE)	0.677
Theta hat (MLE)	0.175	Theta star (bias corrected MLE)	0.528
nu hat (MLE)	16.34	nu star (bias corrected)	5.42
Mean (detects)	0.358		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.202
Maximum	0.86	Median	0.161
SD	0.171	CV	0.845
k hat (MLE)	1.687	k star (bias corrected MLE)	1.524
Theta hat (MLE)	0.12	Theta star (bias corrected MLE)	0.132
nu hat (MLE)	91.1	nu star (bias corrected)	82.31
Adjusted Level of Significance (β)	0.0401		
Approximate Chi Square Value (82.31, α)	62.4	Adjusted Chi Square Value (82.31, β)	61.3
95% Gamma Approximate UCL (use when n>=50)	0.266	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.209	SD (KM)	0.131
Variance (KM)	0.0171	SE of Mean (KM)	0.0336
k hat (KM)	2.557	k star (KM)	2.297
nu hat (KM)	138.1	nu star (KM)	124
theta hat (KM)	0.0818	theta star (KM)	0.091
80% gamma percentile (KM)	0.308	90% gamma percentile (KM)	0.394
95% gamma percentile (KM)	0.475	99% gamma percentile (KM)	0.654

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (124.05, α)	99.33	Adjusted Chi Square Value (124.05, β)	97.91
95% Gamma Approximate KM-UCL (use when n>=50)	0.261	95% Gamma Adjusted KM-UCL (use when n<50)	0.265

On-Project Blue Beach Area Surface Soil

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.813	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.362	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.218	Mean in Log Scale	-1.651
SD in Original Scale	0.147	SD in Log Scale	0.47
95% t UCL (assumes normality of ROS data)	0.266	95% Percentile Bootstrap UCL	0.271
95% BCA Bootstrap UCL	0.288	95% Bootstrap t UCL	0.314
95% H-UCL (Log ROS)	0.256		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.648	KM Geo Mean	0.192
KM SD (logged)	0.333	95% Critical H Value (KM-Log)	1.842
KM Standard Error of Mean (logged)	0.121	95% H-UCL (KM -Log)	0.229
KM SD (logged)	0.333	95% Critical H Value (KM-Log)	1.842
KM Standard Error of Mean (logged)	0.121		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.161	Mean in Log Scale	-1.95
SD in Original Scale	0.142	SD in Log Scale	0.389
95% t UCL (Assumes normality)	0.208	95% H-Stat UCL	0.177

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	0.265

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

On-Project Blue Beach Area Surface Soil

RA_SO_VOCs_VPHs|Acetone|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	15
		Number of Missing Observations	6
Number of Detects	13	Number of Non-Detects	7
Number of Distinct Detects	13	Number of Distinct Non-Detects	3
Minimum Detect	0.0079	Minimum Non-Detect	0.0099
Maximum Detect	0.39	Maximum Non-Detect	0.012
Variance Detects	0.0102	Percent Non-Detects	35%
Mean Detects	0.0735	SD Detects	0.101
Median Detects	0.042	CV Detects	1.377
Skewness Detects	2.915	Kurtosis Detects	9.333
Mean of Logged Detects	-3.185	SD of Logged Detects	1.081

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.619	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.866	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.278	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.234	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0506	KM Standard Error of Mean	0.0196
KM SD	0.0844	95% KM (BCA) UCL	0.0887
95% KM (t) UCL	0.0846	95% KM (Percentile Bootstrap) UCL	0.0836
95% KM (z) UCL	0.0829	95% KM Bootstrap t UCL	0.13
90% KM Chebyshev UCL	0.11	95% KM Chebyshev UCL	0.136
97.5% KM Chebyshev UCL	0.173	99% KM Chebyshev UCL	0.246

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.432	Anderson-Darling GOF Test	
5% A-D Critical Value	0.757	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.141	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.243	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.004	k star (bias corrected MLE)	0.824
Theta hat (MLE)	0.0732	Theta star (bias corrected MLE)	0.0893
nu hat (MLE)	26.11	nu star (bias corrected)	21.42
Mean (detects)	0.0735		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0079	Mean	0.0513
Maximum	0.39	Median	0.0165
SD	0.0862	CV	1.681
k hat (MLE)	0.83	k star (bias corrected MLE)	0.739
Theta hat (MLE)	0.0618	Theta star (bias corrected MLE)	0.0694
nu hat (MLE)	33.2	nu star (bias corrected)	29.55
Adjusted Level of Significance (β)	0.038		
Approximate Chi Square Value (29.55, α)	18.14	Adjusted Chi Square Value (29.55, β)	17.44
95% Gamma Approximate UCL (use when n>=50)	0.0836	95% Gamma Adjusted UCL (use when n<50)	0.0869

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0506	SD (KM)	0.0844
Variance (KM)	0.00712	SE of Mean (KM)	0.0196
k hat (KM)	0.36	k star (KM)	0.339
nu hat (KM)	14.4	nu star (KM)	13.57
theta hat (KM)	0.141	theta star (KM)	0.149
80% gamma percentile (KM)	0.0797	90% gamma percentile (KM)	0.147
95% gamma percentile (KM)	0.222	99% gamma percentile (KM)	0.416

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.57, α)	6.281	Adjusted Chi Square Value (13.57, β)	5.892
95% Gamma Approximate KM-UCL (use when n>=50)	0.109	95% Gamma Adjusted KM-UCL (use when n<50)	0.117

On-Project Blue Beach Area Surface Soil

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.978	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.866	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0855	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.234	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0498	Mean in Log Scale	-3.914
SD in Original Scale	0.087	SD in Log Scale	1.363
95% t UCL (assumes normality of ROS data)	0.0834	95% Percentile Bootstrap UCL	0.0843
95% BCA Bootstrap UCL	0.101	95% Bootstrap t UCL	0.13
95% H-UCL (Log ROS)	0.137		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.756	KM Geo Mean	0.0234
KM SD (logged)	1.145	95% Critical H Value (KM-Log)	2.85
KM Standard Error of Mean (logged)	0.267	95% H-UCL (KM -Log)	0.0951
KM SD (logged)	1.145	95% Critical H Value (KM-Log)	2.85
KM Standard Error of Mean (logged)	0.267		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0498	Mean in Log Scale	-3.883
SD in Original Scale	0.087	SD in Log Scale	1.301
95% t UCL (Assumes normality)	0.0834	95% H-Stat UCL	0.121

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	0.117

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL Input/Output

Off-Project Red Maple Swamp / Tidal Stream Area Combined Media

Off-Project Red Maple Swamp/Tidal Stream Area- Surface Soil, Hydric Soil, and Sediment

Matrix	OffSite FW	Location		Depth	Mercury	D_Mercury	COPPER	D_COPPER	LEAD	D_LEAD	NICKEL	D_NICKEL	SELENIUM	D_SELENIUM	ZINC	D_ZINC	Total PCB Aroclors	D_Total PCB Aroclors
SO	SO-OffProject_RedMapleSwamp	SB-327	SB-327	0 - 1 ft	0.0095	1	6.82	1	16.7	1	4.15	1	0.081	1	34	1	0.062	0
SO	SO-OffProject_RedMapleSwamp	SB-328	SB-328	0 - 1 ft	0.032	1	9.96	1	24.3	1	4.94	1	0.19	1	41.1	1	0.069	0
SO	SO-OffProject_RedMapleSwamp	SB-329	SB-329	0 - 1 ft	0.028	1	10.7	1	28.3	1	22.5	1	0.2	1	92.3	1	0.25	1
SO	SO-OffProject_RedMapleSwamp	SB-330	SB-330	0 - 1 ft	0.0145	1	6.6	1	17.7	1	3.7	1	0.108	1	27.4	1	0.058	0
SO	SO-OffProject_RedMapleSwamp	SB-331	SB-331	0 - 1 ft	0.03	1	9.18	1	28.8	1	4.7	1	0.11	1	90	1	0.13	1
SO	SO-OffProject_RedMapleSwamp	SB-332	SB-332	0 - 1 ft	0.026	1	9.14	1	21.1	1	6.11	1	0.13	1	37.6	1	0.062	0
SO	SO-OffProject_RedMapleSwamp	SB-333	SB-333	0 - 1 ft	0.027	1	9.41	1	37.8	1	4.94	1	0.13	1	38	1	0.11	1
SO	SO-OffProject_RedMapleSwamp	SB-334	SB-334	0 - 1 ft	0.016	1	4.66	1	11.8	1	3.41	1	0.12	1	22.9	1	0.06	0
SO	SO-OffProject_RedMapleSwamp	SB-335	SB-335	0 - 1 ft	0.021	1	3.69	1	13.2	1	3.36	1	0.12	1	18.8	1		
SO	SO-OffProject_RedMapleSwamp	SB-336	SB-336	0 - 1 ft	0.0091	1	2.82	1	11.5	1	2.26	1	0.072	1	15.4	1	0.061	0
SO	SO-OffProject_RedMapleSwamp	SS-1A	SS-1A	0 - 1 ft	0.049	1			22.6	1			5.1	0				
SO	SO-OffProject_RedMapleSwamp	SS-2A	SS-2A	0 - 1 ft	0.036	0			16.7	1			5.3	0				
SO	SO-OffProject_RedMapleSwamp	SS-3A	SS-3A	0 - 1 ft	0.02	1			24.5	1			4.8	0				
SO	SO-OffProject_RedMapleSwamp	SS-4A	SS-4A	0 - 1 ft	0.029	1			23.2	1			4.8	0				
SO	SO-OffProject_RedMapleSwamp	SS-5A	SS-5A	0 - 1 ft	0.031	0			9	1			5.1	0				
SO	SO-OffProject_RedMapleSwamp	SS-6A	SS-6A	0 - 1 ft	0.033	0			18.6	1			4.7	0				
HS	HS-OffProject_RedMapleSwamp	SSH-1	SSH-1	0 - 1 ft	0.042	0			39	1			7.1	0			1.1	1
HS	HS-OffProject_RedMapleSwamp	SSH-2	SSH-2	0 - 1 ft	0.083	0			41.8	1			2.3	1			1.4	1
HS	HS-OffProject_RedMapleSwamp	SSH-3	SSH-3	0 - 1 ft	0.044	1			56.4	1			2.2	1			1.5	1
HS	HS-OffProject_RedMapleSwamp	SSH-301	SSH-301	0 - 1 ft	0.106	1	30.4	1	149	1	17.7	1	0.781	1	105	1	0.49	1
HS	HS-OffProject_RedMapleSwamp	SSH-302	SSH-302	0 - 1 ft	0.21	1	6.78	1	12.8	1	10	1	0.73	1	26.9	1	0.58	1
HS	HS-OffProject_RedMapleSwamp	SSH-303	SSH-303	0 - 1 ft	0.11	1	32.5	1	141	1	17	1	1	1	215	1	0.46	0
HS	HS-OffProject_RedMapleSwamp	SSH-304	SSH-304	0 - 1 ft	0.143	1	44	1	277	1	30.4	1	0.67	1	256	1	0.15	0
HS	HS-OffProject_RedMapleSwamp	SSH-305	SSH-305	0 - 1 ft	0.1	1	30.3	1	50.5	1	12.2	1	0.85	1	49.4	1	0.38	1
HS	HS-OffProject_RedMapleSwamp	SSH-306	SSH-306	0 - 1 ft	0.143	1	24.2	1	89.4	1	10.7	1	0.66	1	39.3	1	0.14	0
HS	HS-OffProject_RedMapleSwamp	SSH-307	SSH-307	0 - 1 ft	0.129	1	18.6	1	49.6	1	18.7	1	0.42	1	108	1	0.24	1
HS	HS-OffProject_RedMapleSwamp	SSH-308	SSH-308	0 - 1 ft	0.147	1	22.7	1	76.7	1	13.2	1	0.69	1	67.6	1	0.16	0
HS	HS-OffProject_RedMapleSwamp	SSH-309	SSH-309	0 - 1 ft	0.16	1	19	1	46.6	1	10.4	1	1	1	38.9	1	0.25	0
HS	HS-OffProject_RedMapleSwamp	SSH-310	SSH-310	0 - 1 ft	0.076	1	10.8	1	23.5	1	5.18	1	0.19	1	24.5	1	0.13	1
HS	HS-OffProject_RedMapleSwamp	SSH-4	SSH-4	0 - 1 ft	0.07	1			93.1	1			3.6	1			2.3	1
HS	HS-OffProject_RedMapleSwamp	SSH-5	SSH-5	0 - 1 ft	0.12	1			158	1			3.5	1			2.1	0
HS	HS-OffProject_RedMapleSwamp	SSH-6	SSH-6	0 - 1 ft	0.124	1			175	1			4.9	1			1.6	1
SE	SE-OffProject_RedMapleSwamp	SED 3	SED 3	0 - 0.5 ft	0.027	1			73.7	1			0.8	1			1.1	1
SE	SE-OffProject_RedMapleSwamp	SED 4	SED 4	0 - 0.5 ft	0.035	0			113	1			0.96	1			1.4	1
SE	SE-OffProject_RedMapleSwamp	SED 5	SED 5	0 - 0.5 ft	0.023	0			4.6	1			3.3	0			1.5	1
SE	SE-OffProject_RedMapleSwamp	SED-103-2014	SED-103-2014	0 - 0.5 ft	0.021	0			6.2	1	17.7	1	3.7	0			0.49	1
SE	SE-OffProject_RedMapleSwamp	SED-104-2014	SED-104-2014	0 - 0.5 ft	0.026	1			34.3	1	10	1	6.8	0			0.58	1
SE	SE-OffProject_RedMapleSwamp	SED-105-2014	SED-105-2014	0 - 0.5 ft	0.044	1			34.4	1	17	1	6	0			0.46	0
SE	SE-OffProject_RedMapleSwamp	SED-326	SED-326	0 - 0.5 ft	0.024	1	8.34	1	17.9	1	30.4	1	0.16	1	61.1	1	0.15	0
SE	SE-OffProject_RedMapleSwamp	SED-327	SED-327	0 - 0.5 ft	0.014	1	6.54	1	20.2	1	12.2	1	0.15	1	45.3	1	0.38	1
SE	SE-OffProject_RedMapleSwamp	SED-328	SED-328	0 - 0.5 ft	0.041	1	13.4	1	31.5	1	10.7	1	0.393	1	84.5	1	0.14	0
SE	SE-OffProject_RedMapleSwamp	SED-329	SED-329	0 - 0.5 ft	0.044	1	11.2	1	30	1	18.7	1	0.32	1	112	1	0.24	1
SE	SE-OffProject_RedMapleSwamp	SED-330	SED-330	0 - 0.5 ft	0.015	1	6.12	1	11.9	1	13.2	1	0.14	1	48.7	1	0.16	0
SE	SE-OffProject_RedMapleSwamp	SED-331	SED-331	0 - 0.5 ft	0.21	1	36.7	1	42	1	10.4	1	1.5	1	294	1	0.25	0
SE	SE-OffProject_RedMapleSwamp	SED-331	SED-331	0 - 0.5 ft							5.18	1					0.13	1
SE	SE-OffProject_RedMapleSwamp	SED-332	SED-332	0 - 0.5 ft	0.15	1	50.6	1	82.4	1			6.19	1	330	1	2.3	1
SE	SE-OffProject_RedMapleSwamp	SED-333	SED-333	0 - 0.5 ft	0.0919	1	21.5	1	116	1			0.792	1	118	1	2.1	0
SE	SE-OffProject_RedMapleSwamp	SED-333	SED-333	0 - 0.5 ft													1.6	1
SE	SE-OffProject_RedMapleSwamp	SED-334	SED-334	0 - 0.5 ft	0.15	1	32.3	1	184	1			1.12	1	103	1		
SE	SE-OffProject_RedMapleSwamp	SED-335	SED-335	0 - 0.5 ft	0.289	1	75.3	1	584	1			1.31	1	253	1		
SE	SE-OffProject_RedMapleSwamp	SED-335	SED-335	0 - 0.5 ft														
SE	SE-OffProject_RedMapleSwamp	SED-336	SED-336	0 - 0.5 ft	0.185	1	45.3	1	248	1			1.1	1	116	1		
SE	SE-OffProject_RedMapleSwamp	SED-337	SED-337	0 - 0.5 ft	0.066	1	20.2	1	111	1			0.34	1	92.4	1		
SE	SE-OffProject_RedMapleSwamp	SED-337	SED-337	0 - 0.5 ft														
SE	SE-OffProject_RedMapleSwamp	SED-338	SED-338	0 - 0.5 ft	0.039	1	14.2	1	43.3	1			0.17	1	62.4	1		
SE	SE-OffProject_RedMapleSwamp	SED-339	SED-339	0 - 0.5 ft	0.011	1	4.35	1	7.57	1			0.05	1	23.1	1		
SE	SE-OffProject_RedMapleSwamp	SED-339	SED-339	0 - 0.5 ft														
SE	SE-OffProject_RedMapleSwamp	SED-340	SED-340	0 - 0.5 ft	0.012	1	3.54	1	9.27	1			0.2	0	19	1		

Off-Project Red Maple Swamp/Tidal Stream Area- Surface Soil, Hydric Soil, and Sediment

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/30/2020 12:00:30 PM
From File	UCL_Input_e.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

COPPER

General Statistics

Total Number of Observations	35	Number of Distinct Observations	35
		Number of Missing Observations	23
Minimum	2.82	Mean	18.91
Maximum	75.3	Median	11.2
SD	16.38	Std. Error of Mean	2.769
Coefficient of Variation	0.866	Skewness	1.603

Normal GOF Test

Shapiro Wilk Test Statistic	0.833	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.934	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.195	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.148	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	23.59	95% Adjusted-CLT UCL (Chen-1995)	24.27
		95% Modified-t UCL (Johnson-1978)	23.72

Gamma GOF Test

A-D Test Statistic	0.547	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.765	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.147	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.151	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.62	k star (bias corrected MLE)	1.5
Theta hat (MLE)	11.68	Theta star (bias corrected MLE)	12.61
nu hat (MLE)	113.4	nu star (bias corrected)	105
MLE Mean (bias corrected)	18.91	MLE Sd (bias corrected)	15.44
		Approximate Chi Square Value (0.05)	82.34
Adjusted Level of Significance	0.0425	Adjusted Chi Square Value	81.39

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	24.11	95% Adjusted Gamma UCL (use when n<50)	24.39

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.971	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.934	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.148	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.037	Mean of logged Data	2.6
Maximum of Logged Data	4.321	SD of logged Data	0.848

Assuming Lognormal Distribution

95% H-UCL	26.88	90% Chebyshev (MVUE) UCL	28.21
95% Chebyshev (MVUE) UCL	32.36	97.5% Chebyshev (MVUE) UCL	38.13
99% Chebyshev (MVUE) UCL	49.46		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Off-Project Red Maple Swamp/Tidal Stream Area- Surface Soil, Hydric Soil, and Sediment

Nonparametric Distribution Free UCLs			
95% CLT UCL	23.46	95% Jackknife UCL	23.59
95% Standard Bootstrap UCL	23.62	95% Bootstrap-t UCL	24.68
95% Hall's Bootstrap UCL	25.18	95% Percentile Bootstrap UCL	23.47
95% BCA Bootstrap UCL	24.03		
90% Chebyshev(Mean, Sd) UCL	27.22	95% Chebyshev(Mean, Sd) UCL	30.98
97.5% Chebyshev(Mean, Sd) UCL	36.2	99% Chebyshev(Mean, Sd) UCL	46.46

Suggested UCL to Use	
95% Adjusted Gamma UCL	24.39

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

LEAD

General Statistics

Total Number of Observations	53	Number of Distinct Observations	52
		Number of Missing Observations	5
Minimum	4.6	Mean	68.12
Maximum	584	Median	34.3
SD	94.97	Std. Error of Mean	13.04
Coefficient of Variation	1.394	Skewness	3.575

Normal GOF Test

Shapiro Wilk Test Statistic	0.624	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	2.22E-16	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.253	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.121	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	89.97	95% Adjusted-CLT UCL (Chen-1995)	96.42
		95% Modified-t UCL (Johnson-1978)	91.04

Gamma GOF Test

A-D Test Statistic	1.444	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.781	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.154	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.126	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.982	k star (bias corrected MLE)	0.939
Theta hat (MLE)	69.34	Theta star (bias corrected MLE)	72.51
nu hat (MLE)	104.1	nu star (bias corrected)	99.58
MLE Mean (bias corrected)	68.12	MLE Sd (bias corrected)	70.28
		Approximate Chi Square Value (0.05)	77.56
Adjusted Level of Significance	0.0455	Adjusted Chi Square Value	77.01

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	87.46	95% Adjusted Gamma UCL (use when n<50)	88.08

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.979	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0.676	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0739	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.121	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.526	Mean of logged Data	3.633
Maximum of Logged Data	6.37	SD of logged Data	1.06

Assuming Lognormal Distribution

95% H-UCL	94.18	90% Chebyshev (MVUE) UCL	99.37
95% Chebyshev (MVUE) UCL	114.8	97.5% Chebyshev (MVUE) UCL	136.3
99% Chebyshev (MVUE) UCL	178.4		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	89.58	95% Jackknife UCL	89.97
95% Standard Bootstrap UCL	89.44	95% Bootstrap-t UCL	104.9
95% Hall's Bootstrap UCL	140.3	95% Percentile Bootstrap UCL	90.23
95% BCA Bootstrap UCL	98.07		
90% Chebyshev(Mean, Sd) UCL	107.3	95% Chebyshev(Mean, Sd) UCL	125
97.5% Chebyshev(Mean, Sd) UCL	149.6	99% Chebyshev(Mean, Sd) UCL	197.9

Suggested UCL to Use

95% H-UCL 94.18

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

NICKEL

General Statistics

Total Number of Observations	30	Number of Distinct Observations	19
		Number of Missing Observations	15
Minimum	2.26	Mean	11.7
Maximum	30.4	Median	10.55
SD	7.574	Std. Error of Mean	1.383
Coefficient of Variation	0.647	Skewness	0.945

Normal GOF Test

Shapiro Wilk Test Statistic	0.897	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.927	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.139	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.159	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	14.05	95% Adjusted-CLT UCL (Chen-1995)	14.23
		95% Modified-t UCL (Johnson-1978)	14.09

Gamma GOF Test

A-D Test Statistic	0.536	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.756	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.148	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.162	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.441	k star (bias corrected MLE)	2.219
Theta hat (MLE)	4.793	Theta star (bias corrected MLE)	5.272
nu hat (MLE)	146.5	nu star (bias corrected)	133.2
MLE Mean (bias corrected)	11.7	MLE Sd (bias corrected)	7.854
		Approximate Chi Square Value (0.05)	107.5
Adjusted Level of Significance	0.041	Adjusted Chi Square Value	106.2

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	14.49	95% Adjusted Gamma UCL (use when n<50)	14.68

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.948	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.927	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.168	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.159	Data Not Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	0.815	Mean of logged Data	2.241
Maximum of Logged Data	3.414	SD of logged Data	0.701

Assuming Lognormal Distribution

95% H-UCL	15.88	90% Chebyshev (MVUE) UCL	16.85
95% Chebyshev (MVUE) UCL	19.09	97.5% Chebyshev (MVUE) UCL	22.2
99% Chebyshev (MVUE) UCL	28.31		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	13.98	95% Jackknife UCL	14.05
95% Standard Bootstrap UCL	13.91	95% Bootstrap-t UCL	14.54
95% Hall's Bootstrap UCL	14.27	95% Percentile Bootstrap UCL	14.09
95% BCA Bootstrap UCL	14.21		
90% Chebyshev(Mean, Sd) UCL	15.85	95% Chebyshev(Mean, Sd) UCL	17.73
97.5% Chebyshev(Mean, Sd) UCL	20.34	99% Chebyshev(Mean, Sd) UCL	25.46

Suggested UCL to Use

95% Student's-t UCL	14.05

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

SELENIUM

General Statistics

Total Number of Observations	53	Number of Distinct Observations	46
		Number of Missing Observations	5
Number of Detects	41	Number of Non-Detects	12
Number of Distinct Detects	37	Number of Distinct Non-Detects	10
Minimum Detect	0.05	Minimum Non-Detect	0.2
Maximum Detect	6.19	Maximum Non-Detect	7.1
Variance Detects	1.822	Percent Non-Detects	22.64%
Mean Detects	0.982	SD Detects	1.35
Median Detects	0.66	CV Detects	1.375
Skewness Detects	2.445	Kurtosis Detects	6.157
Mean of Logged Detects	-0.763	SD of Logged Detects	1.256

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.674	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.941	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.264	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.137	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.925	KM Standard Error of Mean	0.188
KM SD	1.263	95% KM (BCA) UCL	1.249
95% KM (t) UCL	1.24	95% KM (Percentile Bootstrap) UCL	1.251
95% KM (z) UCL	1.234	95% KM Bootstrap t UCL	1.373
90% KM Chebyshev UCL	1.49	95% KM Chebyshev UCL	1.746
97.5% KM Chebyshev UCL	2.101	99% KM Chebyshev UCL	2.799

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.157	Anderson-Darling GOF Test	
5% A-D Critical Value	0.787	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.155	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.143	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.798	k star (bias corrected MLE)	0.756
Theta hat (MLE)	1.23	Theta star (bias corrected MLE)	1.299
nu hat (MLE)	65.42	nu star (bias corrected)	61.97
Mean (detects)	0.982		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.862
Maximum	6.19	Median	0.48
SD	1.211	CV	1.405
k hat (MLE)	0.837	k star (bias corrected MLE)	0.802
Theta hat (MLE)	1.031	Theta star (bias corrected MLE)	1.075
nu hat (MLE)	88.7	nu star (bias corrected)	85.01
Adjusted Level of Significance (β)	0.0455		
Approximate Chi Square Value (85.01, α)	64.76	Adjusted Chi Square Value (85.01, β)	64.27
95% Gamma Approximate UCL (use when n>=50)	1.132	95% Gamma Adjusted UCL (use when n<50)	1.141

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.925	SD (KM)	1.263
Variance (KM)	1.595	SE of Mean (KM)	0.188
k hat (KM)	0.536	k star (KM)	0.518
nu hat (KM)	56.81	nu star (KM)	54.93
theta hat (KM)	1.725	theta star (KM)	1.784
80% gamma percentile (KM)	1.52	90% gamma percentile (KM)	2.483
95% gamma percentile (KM)	3.506	99% gamma percentile (KM)	6.016

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (54.93, α)	38.9	Adjusted Chi Square Value (54.93, β)	38.52
95% Gamma Approximate KM-UCL (use when n>=50)	1.305	95% Gamma Adjusted KM-UCL (use when n<50)	1.318

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.952	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.941	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.14	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.137	Detected Data Not Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.853	Mean in Log Scale	-0.808
SD in Original Scale	1.21	SD in Log Scale	1.123
95% t UCL (assumes normality of ROS data)	1.132	95% Percentile Bootstrap UCL	1.126
95% BCA Bootstrap UCL	1.23	95% Bootstrap t UCL	1.274
95% H-UCL (Log ROS)	1.23		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.815	KM Geo Mean	0.443
KM SD (logged)	1.228	95% Critical H Value (KM-Log)	2.609
KM Standard Error of Mean (logged)	0.19	95% H-UCL (KM -Log)	1.467
KM SD (logged)	1.228	95% Critical H Value (KM-Log)	2.609
KM Standard Error of Mean (logged)	0.19		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.296	Mean in Log Scale	-0.442
SD in Original Scale	1.385	SD in Log Scale	1.328
95% t UCL (Assumes normality)	1.615	95% H-Stat UCL	2.574

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	1.467

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ZINC

General Statistics

Total Number of Observations	35	Number of Distinct Observations	35
		Number of Missing Observations	23
Minimum	15.4	Mean	88.87
Maximum	330	Median	61.1
SD	82.62	Std. Error of Mean	13.97
Coefficient of Variation	0.93	Skewness	1.68

Normal GOF Test

Shapiro Wilk Test Statistic	0.768	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.934	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.219	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.148	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	112.5	95% Adjusted-CLT UCL (Chen-1995)	116.1
		95% Modified-t UCL (Johnson-1978)	113.1

Gamma GOF Test

A-D Test Statistic	0.925	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.766	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.137	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.151	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics			
k hat (MLE)	1.564	k star (bias corrected MLE)	1.449
Theta hat (MLE)	56.81	Theta star (bias corrected MLE)	61.32
nu hat (MLE)	109.5	nu star (bias corrected)	101.5
MLE Mean (bias corrected)	88.87	MLE Sd (bias corrected)	73.82
		Approximate Chi Square Value (0.05)	79.21
Adjusted Level of Significance	0.0425	Adjusted Chi Square Value	78.28

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	113.8	95% Adjusted Gamma UCL (use when n<50)	115.2

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.953	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.934	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0959	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.148	Data appear Lognormal at 5% Significance Level
Data appear Lognormal at 5% Significance Level		

Lognormal Statistics			
Minimum of Logged Data	2.734	Mean of logged Data	4.135
Maximum of Logged Data	5.799	SD of logged Data	0.839

Assuming Lognormal Distribution			
95% H-UCL	123.1	90% Chebyshev (MVUE) UCL	129.3
95% Chebyshev (MVUE) UCL	148.2	97.5% Chebyshev (MVUE) UCL	174.4
99% Chebyshev (MVUE) UCL	225.9		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	111.8	95% Jackknife UCL	112.5
95% Standard Bootstrap UCL	111.6	95% Bootstrap-t UCL	119.9
95% Hall's Bootstrap UCL	115.2	95% Percentile Bootstrap UCL	113.3
95% BCA Bootstrap UCL	115.5		
90% Chebyshev(Mean, Sd) UCL	130.8	95% Chebyshev(Mean, Sd) UCL	149.7
97.5% Chebyshev(Mean, Sd) UCL	176.1	99% Chebyshev(Mean, Sd) UCL	227.8

Suggested UCL to Use	
95% Adjusted Gamma UCL	115.2

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Total PCB Aroclors

General Statistics

Total Number of Observations	41	Number of Distinct Observations	22
		Number of Missing Observations	7
Number of Detects	23	Number of Non-Detects	18
Number of Distinct Detects	12	Number of Distinct Non-Detects	11
Minimum Detect	0.11	Minimum Non-Detect	0.058
Maximum Detect	2.3	Maximum Non-Detect	2.1
Variance Detects	0.498	Percent Non-Detects	43.90%
Mean Detects	0.867	SD Detects	0.706
Median Detects	0.58	CV Detects	0.814
Skewness Detects	0.677	Kurtosis Detects	-0.723
Mean of Logged Detects	-0.554	SD of Logged Detects	1.004

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.872	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.914	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.223	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.18	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.54	KM Standard Error of Mean	0.106
KM SD	0.651	95% KM (BCA) UCL	0.706
95% KM (t) UCL	0.719	95% KM (Percentile Bootstrap) UCL	0.725
95% KM (z) UCL	0.714	95% KM Bootstrap t UCL	0.743
90% KM Chebyshev UCL	0.858	95% KM Chebyshev UCL	1.002
97.5% KM Chebyshev UCL	1.201	99% KM Chebyshev UCL	1.593

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.698	Anderson-Darling GOF Test	
5% A-D Critical Value	0.763	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.16	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.185	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.36	k star (bias corrected MLE)	1.212
Theta hat (MLE)	0.637	Theta star (bias corrected MLE)	0.715
nu hat (MLE)	62.57	nu star (bias corrected)	55.74
Mean (detects)	0.867		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.513
Maximum	2.3	Median	0.182
SD	0.666	CV	1.298
k hat (MLE)	0.493	k star (bias corrected MLE)	0.473
Theta hat (MLE)	1.042	Theta star (bias corrected MLE)	1.085
nu hat (MLE)	40.4	nu star (bias corrected)	38.78
Adjusted Level of Significance (β)	0.0441		
Approximate Chi Square Value (38.78, α)	25.51	Adjusted Chi Square Value (38.78, β)	25.12
95% Gamma Approximate UCL (use when n>=50)	0.78	95% Gamma Adjusted UCL (use when n<50)	0.792

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.54	SD (KM)	0.651
Variance (KM)	0.423	SE of Mean (KM)	0.106
k hat (KM)	0.69	k star (KM)	0.655
nu hat (KM)	56.55	nu star (KM)	53.74
theta hat (KM)	0.784	theta star (KM)	0.825
80% gamma percentile (KM)	0.89	90% gamma percentile (KM)	1.377
95% gamma percentile (KM)	1.884	99% gamma percentile (KM)	3.098

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (53.74, α)	37.9	Adjusted Chi Square Value (53.74, β)	37.41
95% Gamma Approximate KM-UCL (use when n>=50)	0.766	95% Gamma Adjusted KM-UCL (use when n<50)	0.776

Off-Project Red Maple Swamp/Tidal Stream Area- Surface Soil, Hydric Soil, and Sediment

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.914	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.914	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.176	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.18	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.532	Mean in Log Scale	-1.385
SD in Original Scale	0.651	SD in Log Scale	1.266
95% t UCL (assumes normality of ROS data)	0.703	95% Percentile Bootstrap UCL	0.703
95% BCA Bootstrap UCL	0.73	95% Bootstrap t UCL	0.743
95% H-UCL (Log ROS)	0.95		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.401	KM Geo Mean	0.246
KM SD (logged)	1.285	95% Critical H Value (KM-Log)	2.683
KM Standard Error of Mean (logged)	0.216	95% H-UCL (KM -Log)	0.97
KM SD (logged)	1.285	95% Critical H Value (KM-Log)	2.683
KM Standard Error of Mean (logged)	0.216		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.57	Mean in Log Scale	-1.369
SD in Original Scale	0.657	SD in Log Scale	1.398
95% t UCL (Assumes normality)	0.743	95% H-Stat UCL	1.26

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Adjusted Gamma UCL	0.776	95% GROS Adjusted Gamma UCL	0.792

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Mercury

General Statistics

Total Number of Observations	53	Number of Distinct Observations	45
		Number of Missing Observations	5
Number of Detects	45	Number of Non-Detects	8
Number of Distinct Detects	38	Number of Distinct Non-Detects	8
Minimum Detect	0.0091	Minimum Non-Detect	0.021
Maximum Detect	0.289	Maximum Non-Detect	0.083
Variance Detects	0.00457	Percent Non-Detects	15.09%
Mean Detects	0.0763	SD Detects	0.0676
Median Detects	0.044	CV Detects	0.886
Skewness Detects	1.138	Kurtosis Detects	0.813
Mean of Logged Detects	-2.997	SD of Logged Detects	0.975

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.852	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.217	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.131	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0677	KM Standard Error of Mean	0.00904
KM SD	0.065	95% KM (BCA) UCL	0.0834
95% KM (t) UCL	0.0828	95% KM (Percentile Bootstrap) UCL	0.0836
95% KM (z) UCL	0.0826	95% KM Bootstrap t UCL	0.0848
90% KM Chebyshev UCL	0.0948	95% KM Chebyshev UCL	0.107
97.5% KM Chebyshev UCL	0.124	99% KM Chebyshev UCL	0.158

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.01	Anderson-Darling GOF Test	
5% A-D Critical Value	0.771	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.142	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.135	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.322	k star (bias corrected MLE)	1.248
Theta hat (MLE)	0.0577	Theta star (bias corrected MLE)	0.0611
nu hat (MLE)	118.9	nu star (bias corrected)	112.4
Mean (detects)	0.0763		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0091	Mean	0.0673
Maximum	0.289	Median	0.032
SD	0.0658	CV	0.977
k hat (MLE)	1.207	k star (bias corrected MLE)	1.151
Theta hat (MLE)	0.0558	Theta star (bias corrected MLE)	0.0585
nu hat (MLE)	128	nu star (bias corrected)	122.1
Adjusted Level of Significance (β)	0.0455		
Approximate Chi Square Value (122.06, α)	97.54	Adjusted Chi Square Value (122.06, β)	96.93
95% Gamma Approximate UCL (use when n>=50)	0.0843	95% Gamma Adjusted UCL (use when n<50)	0.0848

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0677	SD (KM)	0.065
Variance (KM)	0.00422	SE of Mean (KM)	0.00904
k hat (KM)	1.086	k star (KM)	1.037
nu hat (KM)	115.1	nu star (KM)	110
theta hat (KM)	0.0623	theta star (KM)	0.0653
80% gamma percentile (KM)	0.109	90% gamma percentile (KM)	0.154
95% gamma percentile (KM)	0.2	99% gamma percentile (KM)	0.306

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (109.96, α)	86.76	Adjusted Chi Square Value (109.96, β)	86.18
95% Gamma Approximate KM-UCL (use when n>=50)	0.0858	95% Gamma Adjusted KM-UCL (use when n<50)	0.0864

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.939	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.118	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.131	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0679	Mean in Log Scale	-3.135
SD in Original Scale	0.0654	SD in Log Scale	0.96
95% t UCL (assumes normality of ROS data)	0.0829	95% Percentile Bootstrap UCL	0.0828
95% BCA Bootstrap UCL	0.0838	95% Bootstrap t UCL	0.0851
95% H-UCL (Log ROS)	0.0933		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-3.154	KM Geo Mean	0.0427
KM SD (logged)	0.979	95% Critical H Value (KM-Log)	2.293
KM Standard Error of Mean (logged)	0.138	95% H-UCL (KM -Log)	0.094
KM SD (logged)	0.979	95% Critical H Value (KM-Log)	2.293
KM Standard Error of Mean (logged)	0.138		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0676	Mean in Log Scale	-3.156
SD in Original Scale	0.0656	SD in Log Scale	0.986
95% t UCL (Assumes normality)	0.0827	95% H-Stat UCL	0.0949

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.094

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL Input/Output
Off-Project Red Maple Swamp / Tidal Stream Area Surface Hydric Soil

Off-Project Red Maple Swamp / Tidal Stream Area Surface Hydric Soil

Matrix	HS-OffProject_RedMapleSwamp	Location	Collected	Depth	RA_HS_Metals|Antimony|mg/kg	D_RA_HS_Metals|Antimony|mg/kg	RA_HS_Metals|Cadmium|mg/kg	D_RA_HS_Metals|Cadmium|mg/kg
HS	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	0 - 1 ft			0.26	1
HS	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	0 - 1 ft			1.4	0
HS	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	0 - 1 ft			0.4	1
HS	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:00 AM	0 - 1 ft	0.27	1	0.242	1
HS	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:20 AM	0 - 1 ft	0.3	1	0.41	1
HS	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:40 AM	0 - 1 ft	1.16	1	0.968	1
HS	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:00 AM	0 - 1 ft	0.606	1	2.38	1
HS	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:20 AM	0 - 1 ft	0.4	1	0.16	1
HS	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:40 AM	0 - 1 ft	0.24	1	0.13	1
HS	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:00 AM	0 - 1 ft	0.414	1	0.455	1
HS	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:20 AM	0 - 1 ft	0.29	1	0.255	1
HS	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:40 AM	0 - 1 ft	0.47	1	0.058	1
HS	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:00 AM	0 - 1 ft	0.099	1	0.066	1
HS	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	0 - 1 ft			0.3	1
HS	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	0 - 1 ft			0.4	1
HS	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	0 - 1 ft			1.6	0

Off-Project Red Maple Swamp / Tidal Stream Area Surface Hydric Soil

Matrix	HS-OffProject_RedMapleSwamp	Location	Collected	Depth	RA_HS_Metals|Copper|mg/kg	D_RA_HS_Metals|Copper|mg/kg	RA_HS_Metals|Lead|mg/kg	D_RA_HS_Metals|Lead|mg/kg
HS	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	0 - 1 ft			39	1
HS	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	0 - 1 ft			41.8	1
HS	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	0 - 1 ft			56.4	1
HS	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:00 AM	0 - 1 ft	30.4	1	149	1
HS	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:20 AM	0 - 1 ft	6.78	1	12.8	1
HS	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:40 AM	0 - 1 ft	32.5	1	141	1
HS	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:00 AM	0 - 1 ft	44	1	277	1
HS	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:20 AM	0 - 1 ft	30.3	1	50.5	1
HS	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:40 AM	0 - 1 ft	24.2	1	89.4	1
HS	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:00 AM	0 - 1 ft	18.6	1	49.6	1
HS	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:20 AM	0 - 1 ft	22.7	1	76.7	1
HS	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:40 AM	0 - 1 ft	19	1	46.6	1
HS	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:00 AM	0 - 1 ft	10.8	1	23.5	1
HS	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	0 - 1 ft			93.1	1
HS	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	0 - 1 ft			158	1
HS	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	0 - 1 ft			175	1

Off-Project Red Maple Swamp / Tidal Stream Area Surface Hydric Soil

Matrix	HS-OffProject_RedMapleSwamp	Location	Collected	Depth	RA_HS_Metals|Mercury|mg/kg	D_RA_HS_Metals|Mercury|mg/kg	RA_HS_Metals|Selenium|mg/kg	D_RA_HS_Metals|Selenium|mg/kg
HS	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	0 - 1 ft	0.042	0	7.1	0
HS	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	0 - 1 ft	0.083	0	2.3	1
HS	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	0 - 1 ft	0.044	1	2.2	1
HS	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:00 AM	0 - 1 ft	0.106	1	0.781	1
HS	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:20 AM	0 - 1 ft	0.21	1	0.73	1
HS	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:40 AM	0 - 1 ft	0.11	1	1	1
HS	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:00 AM	0 - 1 ft	0.143	1	0.67	1
HS	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:20 AM	0 - 1 ft	0.1	1	0.85	1
HS	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:40 AM	0 - 1 ft	0.143	1	0.66	1
HS	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:00 AM	0 - 1 ft	0.129	1	0.42	1
HS	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:20 AM	0 - 1 ft	0.147	1	0.69	1
HS	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:40 AM	0 - 1 ft	0.16	1	1	1
HS	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:00 AM	0 - 1 ft	0.076	1	0.19	1
HS	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	0 - 1 ft	0.07	1	3.6	1
HS	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	0 - 1 ft	0.12	1	3.5	1
HS	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	0 - 1 ft	0.124	1	4.9	1

Off-Project Red Maple Swamp / Tidal Stream Area Surface Hydric Soil

Matrix	HS-OffProject_RedMapleSwamp	Location	Collected	Depth	RA_HS_Metals|Thallium|mg/kg	D_RA_HS_Metals|Thallium|mg/kg
HS	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	0 - 1 ft		
HS	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	0 - 1 ft		
HS	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	0 - 1 ft		
HS	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:00 AM	0 - 1 ft	0.242	1
HS	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:20 AM	0 - 1 ft	0.13	1
HS	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:40 AM	0 - 1 ft	0.14	1
HS	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:00 AM	0 - 1 ft	0.266	1
HS	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:20 AM	0 - 1 ft	0.14	1
HS	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:40 AM	0 - 1 ft	0.077	1
HS	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:00 AM	0 - 1 ft	0.11	1
HS	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:20 AM	0 - 1 ft	0.095	0
HS	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:40 AM	0 - 1 ft	0.12	0
HS	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:00 AM	0 - 1 ft	0.054	0
HS	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	0 - 1 ft		
HS	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	0 - 1 ft		
HS	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	0 - 1 ft		

Off-Project Red Maple Swamp / Tidal Stream Area Surface Hydric Soil

Matrix	HS-OffProject_RedMapleSwamp	Location	Collected	Depth	RA_HS_Pest_PCBs|Total PCB Aroclors|mg/kg	D_RA_HS_Pest_PCBs|Total PCB Aroclors|mg/kg
HS	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	0 - 1 ft	1.1	1
HS	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	0 - 1 ft	1.4	1
HS	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	0 - 1 ft	1.5	1
HS	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:00 AM	0 - 1 ft	0.49	1
HS	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:20 AM	0 - 1 ft	0.58	1
HS	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:40 AM	0 - 1 ft	0.46	0
HS	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:00 AM	0 - 1 ft	0.15	0
HS	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:20 AM	0 - 1 ft	0.38	1
HS	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:40 AM	0 - 1 ft	0.14	0
HS	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:00 AM	0 - 1 ft	0.24	1
HS	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:20 AM	0 - 1 ft	0.16	0
HS	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:40 AM	0 - 1 ft	0.25	0
HS	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:00 AM	0 - 1 ft	0.13	1
HS	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	0 - 1 ft	2.3	1
HS	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	0 - 1 ft	2.1	0
HS	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	0 - 1 ft	1.6	1

Off-Project Red Maple Swamp / Tidal Stream Area Surface Hydric Soil

Matrix	HS-OffProject_RedMapleSwamp	Location	Collected	Depth	RA_HS_SVOCs|2,4-Dichlorophenol|mg/kg	D_RA_HS_SVOCs|2,4-Dichlorophenol|mg/kg	RA_HS_VOCs|Acetone|mg/kg	D_RA_HS_VOCs|Acetone|mg/kg
HS	HS-OffProject_RedMapleSwamp	SSH-1	11/30/2011 12:00 AM	0 - 1 ft			0.117	0
HS	HS-OffProject_RedMapleSwamp	SSH-2	11/29/2011 12:00 AM	0 - 1 ft			0.119	1
HS	HS-OffProject_RedMapleSwamp	SSH-3	11/29/2011 12:00 AM	0 - 1 ft			0.203	1
HS	HS-OffProject_RedMapleSwamp	SSH-301	10/4/2019 8:00 AM	0 - 1 ft	0.68	1		
HS	HS-OffProject_RedMapleSwamp	SSH-302	10/4/2019 8:20 AM	0 - 1 ft	1.6	1		
HS	HS-OffProject_RedMapleSwamp	SSH-303	10/4/2019 8:40 AM	0 - 1 ft	1.8	1		
HS	HS-OffProject_RedMapleSwamp	SSH-304	10/4/2019 9:00 AM	0 - 1 ft	0.58	1		
HS	HS-OffProject_RedMapleSwamp	SSH-305	10/4/2019 9:20 AM	0 - 1 ft	1.1	1		
HS	HS-OffProject_RedMapleSwamp	SSH-306	10/4/2019 9:40 AM	0 - 1 ft	0.69	1		
HS	HS-OffProject_RedMapleSwamp	SSH-307	10/4/2019 10:00 AM	0 - 1 ft	0.56	1		
HS	HS-OffProject_RedMapleSwamp	SSH-308	10/4/2019 10:20 AM	0 - 1 ft	0.7	1		
HS	HS-OffProject_RedMapleSwamp	SSH-309	10/4/2019 10:40 AM	0 - 1 ft	1	0		
HS	HS-OffProject_RedMapleSwamp	SSH-310	10/4/2019 11:00 AM	0 - 1 ft	0.44	0		
HS	HS-OffProject_RedMapleSwamp	SSH-4	11/29/2011 12:00 AM	0 - 1 ft			0.733	1
HS	HS-OffProject_RedMapleSwamp	SSH-5	11/29/2011 12:00 AM	0 - 1 ft			0.676	1
HS	HS-OffProject_RedMapleSwamp	SSH-6	11/29/2011 12:00 AM	0 - 1 ft			4.29	1

Off-Project Red Maple Swamp/Tidal Stream Area Hydric Soil

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/30/2020 4:57:51 PM
From File	UCL_Input_d.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_HS_Metals|Antimony|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	3
Minimum	0.099	Mean	0.425
Maximum	1.16	Median	0.35
SD	0.293	Std. Error of Mean	0.0927
Coefficient of Variation	0.69	Skewness	1.95

Normal GOF Test

Shapiro Wilk Test Statistic	0.809	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.239	Lilliefors GOF Test
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.595	95% Adjusted-CLT UCL (Chen-1995)	0.639
		95% Modified-t UCL (Johnson-1978)	0.604

Gamma GOF Test

A-D Test Statistic	0.351	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.733	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.156	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.269	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.877	k star (bias corrected MLE)	2.08
Theta hat (MLE)	0.148	Theta star (bias corrected MLE)	0.204
nu hat (MLE)	57.54	nu star (bias corrected)	41.61
MLE Mean (bias corrected)	0.425	MLE Sd (bias corrected)	0.295
		Approximate Chi Square Value (0.05)	27.82
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	25.88

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.635	95% Adjusted Gamma UCL (use when n<50)	0.683

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.174	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.313	Mean of logged Data	-1.04
Maximum of Logged Data	0.148	SD of logged Data	0.644

Assuming Lognormal Distribution

95% H-UCL	0.734	90% Chebyshev (MVUE) UCL	0.691
95% Chebyshev (MVUE) UCL	0.812	97.5% Chebyshev (MVUE) UCL	0.98
99% Chebyshev (MVUE) UCL	1.309		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Off-Project Red Maple Swamp/Tidal Stream Area Hydric Soil

Nonparametric Distribution Free UCLs			
95% CLT UCL	0.577	95% Jackknife UCL	0.595
95% Standard Bootstrap UCL	0.567	95% Bootstrap-t UCL	0.752
95% Hall's Bootstrap UCL	1.342	95% Percentile Bootstrap UCL	0.578
95% BCA Bootstrap UCL	0.629		
90% Chebyshev(Mean, Sd) UCL	0.703	95% Chebyshev(Mean, Sd) UCL	0.829
97.5% Chebyshev(Mean, Sd) UCL	1.004	99% Chebyshev(Mean, Sd) UCL	1.348

Suggested UCL to Use	
95% Student's-t UCL	0.595

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_HS_Metals|Cadmium|mg/kg

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
Number of Detects	14	Number of Non-Detects	2
Number of Distinct Detects	13	Number of Distinct Non-Detects	2
Minimum Detect	0.058	Minimum Non-Detect	1.4
Maximum Detect	2.38	Maximum Non-Detect	1.6
Variance Detects	0.356	Percent Non-Detects	12.50%
Mean Detects	0.463	SD Detects	0.596
Median Detects	0.28	CV Detects	1.288
Skewness Detects	2.937	Kurtosis Detects	9.352
Mean of Logged Detects	-1.247	SD of Logged Detects	0.971

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.606	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.363	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.226	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.445	KM Standard Error of Mean	0.143
KM SD	0.546	95% KM (BCA) UCL	0.707
95% KM (t) UCL	0.696	95% KM (Percentile Bootstrap) UCL	0.697
95% KM (z) UCL	0.68	95% KM Bootstrap t UCL	1.205
90% KM Chebyshev UCL	0.875	95% KM Chebyshev UCL	1.07
97.5% KM Chebyshev UCL	1.34	99% KM Chebyshev UCL	1.871

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.673	Anderson-Darling GOF Test	
5% A-D Critical Value	0.756	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.243	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.234	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.188	k star (bias corrected MLE)	0.981
Theta hat (MLE)	0.39	Theta star (bias corrected MLE)	0.472
nu hat (MLE)	33.25	nu star (bias corrected)	27.46
Mean (detects)	0.463		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.058	Mean	0.439
Maximum	2.38	Median	0.27
SD	0.559	CV	1.274
k hat (MLE)	1.301	k star (bias corrected MLE)	1.099
Theta hat (MLE)	0.337	Theta star (bias corrected MLE)	0.4
nu hat (MLE)	41.63	nu star (bias corrected)	35.16
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (35.16, α)	22.59	Adjusted Chi Square Value (35.16, β)	21.45
95% Gamma Approximate UCL (use when n>=50)	0.683	95% Gamma Adjusted UCL (use when n<50)	0.72

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.445	SD (KM)	0.546
Variance (KM)	0.298	SE of Mean (KM)	0.143
k hat (KM)	0.664	k star (KM)	0.581
nu hat (KM)	21.25	nu star (KM)	18.6
theta hat (KM)	0.67	theta star (KM)	0.765
80% gamma percentile (KM)	0.733	90% gamma percentile (KM)	1.165
95% gamma percentile (KM)	1.619	99% gamma percentile (KM)	2.719

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (18.60, α)	9.823	Adjusted Chi Square Value (18.60, β)	9.104
95% Gamma Approximate KM-UCL (use when n>=50)	0.842	95% Gamma Adjusted KM-UCL (use when n<50)	0.908

Off-Project Red Maple Swamp/Tidal Stream Area Hydric Soil

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.953	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.175	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.226	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.437	Mean in Log Scale	-1.261
SD in Original Scale	0.56	SD in Log Scale	0.905
95% t UCL (assumes normality of ROS data)	0.683	95% Percentile Bootstrap UCL	0.678
95% BCA Bootstrap UCL	0.851	95% Bootstrap t UCL	1.302
95% H-UCL (Log ROS)	0.776		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.267	KM Geo Mean	0.282
KM SD (logged)	0.917	95% Critical H Value (KM-Log)	2.578
KM Standard Error of Mean (logged)	0.249	95% H-UCL (KM -Log)	0.789
KM SD (logged)	0.917	95% Critical H Value (KM-Log)	2.578
KM Standard Error of Mean (logged)	0.249		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.499	Mean in Log Scale	-1.127
SD in Original Scale	0.564	SD in Log Scale	0.961
95% t UCL (Assumes normality)	0.746	95% H-Stat UCL	0.992

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	0.908

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_HS_Metals|Copper|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	3
Minimum	6.78	Mean	23.93
Maximum	44	Median	23.45
SD	10.95	Std. Error of Mean	3.463
Coefficient of Variation	0.458	Skewness	0.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.977	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.12	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	30.28	95% Adjusted-CLT UCL (Chen-1995)	29.83
		95% Modified-t UCL (Johnson-1978)	30.31

Gamma GOF Test

A-D Test Statistic	0.287	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.729	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.166	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.268	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.363	k star (bias corrected MLE)	3.121
Theta hat (MLE)	5.485	Theta star (bias corrected MLE)	7.668
nu hat (MLE)	87.25	nu star (bias corrected)	62.41
MLE Mean (bias corrected)	23.93	MLE Sd (bias corrected)	13.55
		Approximate Chi Square Value (0.05)	45.24
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	42.71

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	33.01	95% Adjusted Gamma UCL (use when n<50)	34.97

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.922	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.205	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.914	Mean of logged Data	3.056
Maximum of Logged Data	3.784	SD of logged Data	0.556

Assuming Lognormal Distribution

95% H-UCL	37.96	90% Chebyshev (MVUE) UCL	37.49
95% Chebyshev (MVUE) UCL	43.44	97.5% Chebyshev (MVUE) UCL	51.69
99% Chebyshev (MVUE) UCL	67.89		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	29.62	95% Jackknife UCL	30.28
95% Standard Bootstrap UCL	29.35	95% Bootstrap-t UCL	30.43
95% Hall's Bootstrap UCL	30.47	95% Percentile Bootstrap UCL	29.59
95% BCA Bootstrap UCL	29.71		
90% Chebyshev(Mean, Sd) UCL	34.32	95% Chebyshev(Mean, Sd) UCL	39.02
97.5% Chebyshev(Mean, Sd) UCL	45.56	99% Chebyshev(Mean, Sd) UCL	58.39

Suggested UCL to Use

95% Student's-t UCL	30.28

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_HS_Metals|Lead|mg/kg

General Statistics

Total Number of Observations	16	Number of Distinct Observations	16
		Number of Missing Observations	0
Minimum	12.8	Mean	92.46
Maximum	277	Median	66.55
SD	70.48	Std. Error of Mean	17.62
Coefficient of Variation	0.762	Skewness	1.307

Normal GOF Test

Shapiro Wilk Test Statistic	0.872	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.196	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	123.3	95% Adjusted-CLT UCL (Chen-1995)	127.6
		95% Modified-t UCL (Johnson-1978)	124.3

Gamma GOF Test

A-D Test Statistic	0.286	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.751	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.151	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.218	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.946	k star (bias corrected MLE)	1.623
Theta hat (MLE)	47.52	Theta star (bias corrected MLE)	56.98
nu hat (MLE)	62.27	nu star (bias corrected)	51.93
MLE Mean (bias corrected)	92.46	MLE Sd (bias corrected)	72.59
		Approximate Chi Square Value (0.05)	36.37
Adjusted Level of Significance	0.0335	Adjusted Chi Square Value	34.9

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	132	95% Adjusted Gamma UCL (use when n<50)	137.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.974	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.887	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.12	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.213	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.549	Mean of logged Data	4.248
Maximum of Logged Data	5.624	SD of logged Data	0.805

Assuming Lognormal Distribution

95% H-UCL	160.1	90% Chebyshev (MVUE) UCL	155.4
95% Chebyshev (MVUE) UCL	183.1	97.5% Chebyshev (MVUE) UCL	221.5
99% Chebyshev (MVUE) UCL	297		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	121.4	95% Jackknife UCL	123.3
95% Standard Bootstrap UCL	120.7	95% Bootstrap-t UCL	135.7
95% Hall's Bootstrap UCL	134.1	95% Percentile Bootstrap UCL	121.9
95% BCA Bootstrap UCL	125		
90% Chebyshev(Mean, Sd) UCL	145.3	95% Chebyshev(Mean, Sd) UCL	169.3
97.5% Chebyshev(Mean, Sd) UCL	202.5	99% Chebyshev(Mean, Sd) UCL	267.8

Suggested UCL to Use

95% Student's-t UCL	123.3

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_HS_Metals|Mercury|mg/kg

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
Number of Detects	14	Number of Non-Detects	2
Number of Distinct Detects	13	Number of Distinct Non-Detects	2
Minimum Detect	0.044	Minimum Non-Detect	0.042
Maximum Detect	0.21	Maximum Non-Detect	0.083
Variance Detects	0.00173	Percent Non-Detects	12.50%
Mean Detects	0.12	SD Detects	0.0416
Median Detects	0.122	CV Detects	0.346
Skewness Detects	0.209	Kurtosis Detects	0.768
Mean of Logged Detects	-2.184	SD of Logged Detects	0.393

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.978	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.116	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.226	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.111	KM Standard Error of Mean	0.0116
KM SD	0.0443	95% KM (BCA) UCL	0.129
95% KM (t) UCL	0.132	95% KM (Percentile Bootstrap) UCL	0.129
95% KM (z) UCL	0.13	95% KM Bootstrap t UCL	0.131
90% KM Chebyshev UCL	0.146	95% KM Chebyshev UCL	0.162
97.5% KM Chebyshev UCL	0.184	99% KM Chebyshev UCL	0.226

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.307	Anderson-Darling GOF Test	
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.138	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.229	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	7.915	k star (bias corrected MLE)	6.266
Theta hat (MLE)	0.0152	Theta star (bias corrected MLE)	0.0192
nu hat (MLE)	221.6	nu star (bias corrected)	175.5
Mean (detects)	0.12		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0384	Mean	0.112
Maximum	0.21	Median	0.115
SD	0.0456	CV	0.409
k hat (MLE)	5.551	k star (bias corrected MLE)	4.552
Theta hat (MLE)	0.0201	Theta star (bias corrected MLE)	0.0245
nu hat (MLE)	177.6	nu star (bias corrected)	145.7
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (145.65, α)	118.8	Adjusted Chi Square Value (145.65, β)	116
95% Gamma Approximate UCL (use when n>=50)	0.137	95% Gamma Adjusted UCL (use when n<50)	0.14

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.111	SD (KM)	0.0443
Variance (KM)	0.00197	SE of Mean (KM)	0.0116
k hat (KM)	6.309	k star (KM)	5.167
nu hat (KM)	201.9	nu star (KM)	165.4
theta hat (KM)	0.0177	theta star (KM)	0.0216
80% gamma percentile (KM)	0.149	90% gamma percentile (KM)	0.177
95% gamma percentile (KM)	0.202	99% gamma percentile (KM)	0.256

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (165.36, α)	136.6	Adjusted Chi Square Value (165.36, β)	133.7
95% Gamma Approximate KM-UCL (use when n>=50)	0.135	95% Gamma Adjusted KM-UCL (use when n<50)	0.138

Off-Project Red Maple Swamp/Tidal Stream Area Hydric Soil

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.935	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.167	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.226	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.112	Mean in Log Scale	-2.277
SD in Original Scale	0.045	SD in Log Scale	0.452
95% t UCL (assumes normality of ROS data)	0.132	95% Percentile Bootstrap UCL	0.131
95% BCA Bootstrap UCL	0.131	95% Bootstrap t UCL	0.132
95% H-UCL (Log ROS)	0.143		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.289	KM Geo Mean	0.101
KM SD (logged)	0.459	95% Critical H Value (KM-Log)	2.009
KM Standard Error of Mean (logged)	0.121	95% H-UCL (KM -Log)	0.143
KM SD (logged)	0.459	95% Critical H Value (KM-Log)	2.009
KM Standard Error of Mean (logged)	0.121		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.109	Mean in Log Scale	-2.351
SD in Original Scale	0.0493	SD in Log Scale	0.599
95% t UCL (Assumes normality)	0.131	95% H-Stat UCL	0.159

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.132

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_HS_Metals|Selenium|mg/kg

General Statistics

Total Number of Observations	16	Number of Distinct Observations	15
Number of Detects	15	Number of Non-Detects	1
Number of Distinct Detects	14	Number of Distinct Non-Detects	1
Minimum Detect	0.19	Minimum Non-Detect	7.1
Maximum Detect	4.9	Maximum Non-Detect	7.1
Variance Detects	2	Percent Non-Detects	6.25%
Mean Detects	1.566	SD Detects	1.414
Median Detects	0.85	CV Detects	0.903
Skewness Detects	1.32	Kurtosis Detects	0.727
Mean of Logged Detects	0.087	SD of Logged Detects	0.891

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.799	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.322	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.22	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.566	KM Standard Error of Mean	0.365
KM SD	1.366	95% KM (BCA) UCL	2.219
95% KM (t) UCL	2.206	95% KM (Percentile Bootstrap) UCL	2.169
95% KM (z) UCL	2.167	95% KM Bootstrap t UCL	2.422
90% KM Chebyshev UCL	2.662	95% KM Chebyshev UCL	3.158
97.5% KM Chebyshev UCL	3.846	99% KM Chebyshev UCL	5.199

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.754	Anderson-Darling GOF Test	
5% A-D Critical Value	0.753	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.26	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.225	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.528	k star (bias corrected MLE)	1.267
Theta hat (MLE)	1.025	Theta star (bias corrected MLE)	1.236
nu hat (MLE)	45.84	nu star (bias corrected)	38.01
Mean (detects)	1.566		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.19	Mean	1.547
Maximum	4.9	Median	0.925
SD	1.368	CV	0.885
k hat (MLE)	1.616	k star (bias corrected MLE)	1.354
Theta hat (MLE)	0.957	Theta star (bias corrected MLE)	1.142
nu hat (MLE)	51.7	nu star (bias corrected)	43.34
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (43.34, α)	29.25	Adjusted Chi Square Value (43.34, β)	27.93
95% Gamma Approximate UCL (use when n>=50)	2.292	95% Gamma Adjusted UCL (use when n<50)	2.4

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.566	SD (KM)	1.366
Variance (KM)	1.867	SE of Mean (KM)	0.365
k hat (KM)	1.314	k star (KM)	1.109
nu hat (KM)	42.04	nu star (KM)	35.49
theta hat (KM)	1.192	theta star (KM)	1.412
80% gamma percentile (KM)	2.498	90% gamma percentile (KM)	3.515
95% gamma percentile (KM)	4.524	99% gamma percentile (KM)	6.848

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (35.49, α)	22.86	Adjusted Chi Square Value (35.49, β)	21.71
95% Gamma Approximate KM-UCL (use when n>=50)	2.431	95% Gamma Adjusted KM-UCL (use when n<50)	2.56

Off-Project Red Maple Swamp/Tidal Stream Area Hydric Soil

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.938	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.881	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.206	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.22	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.536	Mean in Log Scale	0.087
SD in Original Scale	1.371	SD in Log Scale	0.86
95% t UCL (assumes normality of ROS data)	2.137	95% Percentile Bootstrap UCL	2.088
95% BCA Bootstrap UCL	2.19	95% Bootstrap t UCL	2.363
95% H-UCL (Log ROS)	2.751		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.087	KM Geo Mean	1.091
KM SD (logged)	0.86	95% Critical H Value (KM-Log)	2.497
KM Standard Error of Mean (logged)	0.23	95% H-UCL (KM -Log)	2.751
KM SD (logged)	0.86	95% Critical H Value (KM-Log)	2.497
KM Standard Error of Mean (logged)	0.23		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.69	Mean in Log Scale	0.161
SD in Original Scale	1.454	SD in Log Scale	0.91
95% t UCL (Assumes normality)	2.327	95% H-Stat UCL	3.246

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	2.751

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_HS_Metals|Thallium|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
		Number of Missing Observations	3
Number of Detects	7	Number of Non-Detects	3
Number of Distinct Detects	6	Number of Distinct Non-Detects	3
Minimum Detect	0.077	Minimum Non-Detect	0.054
Maximum Detect	0.266	Maximum Non-Detect	0.12
Variance Detects	0.00484	Percent Non-Detects	30%
Mean Detects	0.158	SD Detects	0.0695
Median Detects	0.14	CV Detects	0.441
Skewness Detects	0.825	Kurtosis Detects	-0.697
Mean of Logged Detects	-1.927	SD of Logged Detects	0.432

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.874	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.316	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.13	KM Standard Error of Mean	0.0238
KM SD	0.0692	95% KM (BCA) UCL	0.17
95% KM (t) UCL	0.174	95% KM (Percentile Bootstrap) UCL	0.17
95% KM (z) UCL	0.169	95% KM Bootstrap t UCL	0.193
90% KM Chebyshev UCL	0.202	95% KM Chebyshev UCL	0.234
97.5% KM Chebyshev UCL	0.279	99% KM Chebyshev UCL	0.367

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.414	Anderson-Darling GOF Test	
5% A-D Critical Value	0.709	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.279	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.313	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	6.364	k star (bias corrected MLE)	3.732
Theta hat (MLE)	0.0248	Theta star (bias corrected MLE)	0.0423
nu hat (MLE)	89.1	nu star (bias corrected)	52.25
Mean (detects)	0.158		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0171	Mean	0.123
Maximum	0.266	Median	0.12
SD	0.0809	CV	0.66
k hat (MLE)	2.15	k star (bias corrected MLE)	1.571
Theta hat (MLE)	0.057	Theta star (bias corrected MLE)	0.078
nu hat (MLE)	42.99	nu star (bias corrected)	31.43
Adjusted Level of Significance (β)	0.0267		
Approximate Chi Square Value (31.43, α)	19.62	Adjusted Chi Square Value (31.43, β)	18.01
95% Gamma Approximate UCL (use when n>=50)	0.196	95% Gamma Adjusted UCL (use when n<50)	0.214

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.13	SD (KM)	0.0692
Variance (KM)	0.00478	SE of Mean (KM)	0.0238
k hat (KM)	3.539	k star (KM)	2.544
nu hat (KM)	70.78	nu star (KM)	50.88
theta hat (KM)	0.0368	theta star (KM)	0.0511
80% gamma percentile (KM)	0.189	90% gamma percentile (KM)	0.239
95% gamma percentile (KM)	0.287	99% gamma percentile (KM)	0.39

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (50.88, α)	35.5	Adjusted Chi Square Value (50.88, β)	33.28
95% Gamma Approximate KM-UCL (use when n>=50)	0.186	95% Gamma Adjusted KM-UCL (use when n<50)	0.199

Off-Project Red Maple Swamp/Tidal Stream Area Hydric Soil

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.931	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.251	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.129	Mean in Log Scale	-2.186
SD in Original Scale	0.0734	SD in Log Scale	0.555
95% t UCL (assumes normality of ROS data)	0.172	95% Percentile Bootstrap UCL	0.166
95% BCA Bootstrap UCL	0.172	95% Bootstrap t UCL	0.197
95% H-UCL (Log ROS)	0.201		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.175	KM Geo Mean	0.114
KM SD (logged)	0.522	95% Critical H Value (KM-Log)	2.251
KM Standard Error of Mean (logged)	0.184	95% H-UCL (KM -Log)	0.192
KM SD (logged)	0.522	95% Critical H Value (KM-Log)	2.251
KM Standard Error of Mean (logged)	0.184		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.124	Mean in Log Scale	-2.296
SD in Original Scale	0.0792	SD in Log Scale	0.718
95% t UCL (Assumes normality)	0.17	95% H-Stat UCL	0.241

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.174

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Area Hydric Soil

RA_HS_Pest_PCBs|Total PCB Aroclors|mg/kg

General Statistics			
Total Number of Observations	16	Number of Distinct Observations	16
Number of Detects	10	Number of Non-Detects	6
Number of Distinct Detects	10	Number of Distinct Non-Detects	6
Minimum Detect	0.13	Minimum Non-Detect	0.14
Maximum Detect	2.3	Maximum Non-Detect	2.1
Variance Detects	0.513	Percent Non-Detects	37.50%
Mean Detects	0.972	SD Detects	0.716
Median Detects	0.84	CV Detects	0.737
Skewness Detects	0.547	Kurtosis Detects	-0.718
Mean of Logged Detects	-0.355	SD of Logged Detects	0.936

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.208	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.689	KM Standard Error of Mean	0.181
KM SD	0.672	95% KM (BCA) UCL	1.019
95% KM (t) UCL	1.007	95% KM (Percentile Bootstrap) UCL	0.973
95% KM (z) UCL	0.987	95% KM Bootstrap t UCL	1.081
90% KM Chebyshev UCL	1.232	95% KM Chebyshev UCL	1.478
97.5% KM Chebyshev UCL	1.82	99% KM Chebyshev UCL	2.49

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.293	Anderson-Darling GOF Test	
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.175	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.271	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.677	k star (bias corrected MLE)	1.241
Theta hat (MLE)	0.58	Theta star (bias corrected MLE)	0.784
nu hat (MLE)	33.54	nu star (bias corrected)	24.81
Mean (detects)	0.972		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0475	Mean	0.662
Maximum	2.3	Median	0.416
SD	0.698	CV	1.055
k hat (MLE)	0.862	k star (bias corrected MLE)	0.742
Theta hat (MLE)	0.768	Theta star (bias corrected MLE)	0.892
nu hat (MLE)	27.59	nu star (bias corrected)	23.75
Adjusted Level of Significance (β)	0.0335		
Approximate Chi Square Value (23.75, α)	13.66	Adjusted Chi Square Value (23.75, β)	12.79
95% Gamma Approximate UCL (use when n>=50)	1.151	95% Gamma Adjusted UCL (use when n<50)	1.228

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.689	SD (KM)	0.672
Variance (KM)	0.451	SE of Mean (KM)	0.181
k hat (KM)	1.053	k star (KM)	0.898
nu hat (KM)	33.71	nu star (KM)	28.72
theta hat (KM)	0.654	theta star (KM)	0.768
80% gamma percentile (KM)	1.118	90% gamma percentile (KM)	1.63
95% gamma percentile (KM)	2.146	99% gamma percentile (KM)	3.353

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (28.72, α)	17.49	Adjusted Chi Square Value (28.72, β)	16.5
95% Gamma Approximate KM-UCL (use when n>=50)	1.132	95% Gamma Adjusted KM-UCL (use when n<50)	1.2

Off-Project Red Maple Swamp/Tidal Stream Area Hydric Soil

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.94	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.185	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.68	Mean in Log Scale	-0.863
SD in Original Scale	0.68	SD in Log Scale	1.015
95% t UCL (assumes normality of ROS data)	0.978	95% Percentile Bootstrap UCL	0.962
95% BCA Bootstrap UCL	0.971	95% Bootstrap t UCL	1.071
95% H-UCL (Log ROS)	1.443		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.899	KM Geo Mean	0.407
KM SD (logged)	1.054	95% Critical H Value (KM-Log)	2.788
KM Standard Error of Mean (logged)	0.288	95% H-UCL (KM -Log)	1.514
KM SD (logged)	1.054	95% Critical H Value (KM-Log)	2.788
KM Standard Error of Mean (logged)	0.288		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.709	Mean in Log Scale	-0.927
SD in Original Scale	0.693	SD in Log Scale	1.212
95% t UCL (Assumes normality)	1.013	95% H-Stat UCL	2.141

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.007

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_HS_SVOCs|2,4-Dichlorophenol|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	3
Number of Detects	8	Number of Non-Detects	2
Number of Distinct Detects	8	Number of Distinct Non-Detects	2
Minimum Detect	0.56	Minimum Non-Detect	0.44
Maximum Detect	1.8	Maximum Non-Detect	1
Variance Detects	0.237	Percent Non-Detects	20%
Mean Detects	0.964	SD Detects	0.487
Median Detects	0.695	CV Detects	0.505
Skewness Detects	1.092	Kurtosis Detects	-0.509
Mean of Logged Detects	-0.136	SD of Logged Detects	0.459

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.793	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.331	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.876	KM Standard Error of Mean	0.151
KM SD	0.446	95% KM (BCA) UCL	1.11
95% KM (t) UCL	1.153	95% KM (Percentile Bootstrap) UCL	1.117
95% KM (z) UCL	1.125	95% KM Bootstrap t UCL	1.426
90% KM Chebyshev UCL	1.329	95% KM Chebyshev UCL	1.535
97.5% KM Chebyshev UCL	1.82	99% KM Chebyshev UCL	2.38

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.74	Anderson-Darling GOF Test	
5% A-D Critical Value	0.719	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.332	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.295	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	5.228	k star (bias corrected MLE)	3.351
Theta hat (MLE)	0.184	Theta star (bias corrected MLE)	0.288
nu hat (MLE)	83.64	nu star (bias corrected)	53.61
Mean (detects)	0.964		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.119	Mean	0.841
Maximum	1.8	Median	0.685
SD	0.513	CV	0.61
k hat (MLE)	2.621	k star (bias corrected MLE)	1.902
Theta hat (MLE)	0.321	Theta star (bias corrected MLE)	0.442
nu hat (MLE)	52.43	nu star (bias corrected)	38.03
Adjusted Level of Significance (β)	0.0267		
Approximate Chi Square Value (38.03, α)	24.91	Adjusted Chi Square Value (38.03, β)	23.08
95% Gamma Approximate UCL (use when n>=50)	1.284	95% Gamma Adjusted UCL (use when n<50)	1.386

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.876	SD (KM)	0.446
Variance (KM)	0.199	SE of Mean (KM)	0.151
k hat (KM)	3.855	k star (KM)	2.765
nu hat (KM)	77.1	nu star (KM)	55.3
theta hat (KM)	0.227	theta star (KM)	0.317
80% gamma percentile (KM)	1.261	90% gamma percentile (KM)	1.582
95% gamma percentile (KM)	1.882	99% gamma percentile (KM)	2.536

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (55.30, α)	39.21	Adjusted Chi Square Value (55.30, β)	36.87
95% Gamma Approximate KM-UCL (use when n>=50)	1.235	95% Gamma Adjusted KM-UCL (use when n<50)	1.314

Off-Project Red Maple Swamp/Tidal Stream Area Hydric Soil

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.839	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.31	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data Not Lognormal at 5% Significance Level	
Detected Data appear Approximate Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.863	Mean in Log Scale	-0.275
SD in Original Scale	0.484	SD in Log Scale	0.525
95% t UCL (assumes normality of ROS data)	1.144	95% Percentile Bootstrap UCL	1.106
95% BCA Bootstrap UCL	1.133	95% Bootstrap t UCL	1.39
95% H-UCL (Log ROS)	1.293		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.242	KM Geo Mean	0.785
KM SD (logged)	0.447	95% Critical H Value (KM-Log)	2.148
KM Standard Error of Mean (logged)	0.152	95% H-UCL (KM -Log)	1.196
KM SD (logged)	0.447	95% Critical H Value (KM-Log)	2.148
KM Standard Error of Mean (logged)	0.152		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.843	Mean in Log Scale	-0.329
SD in Original Scale	0.503	SD in Log Scale	0.607
95% t UCL (Assumes normality)	1.135	95% H-Stat UCL	1.399
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics			
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level			

Suggested UCL to Use			
KM Student's t	1.157	KM H-UCL	1.196

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_HS_VOCs|Acetone|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	10
Number of Detects	5	Number of Non-Detects	1
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	0.119	Minimum Non-Detect	0.117
Maximum Detect	4.29	Maximum Non-Detect	0.117
Variance Detects	3.051	Percent Non-Detects	16.67%
Mean Detects	1.204	SD Detects	1.747
Median Detects	0.676	CV Detects	1.45
Skewness Detects	2.099	Kurtosis Detects	4.516
Mean of Logged Detects	-0.594	SD of Logged Detects	1.386

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.689	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.406	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.023	KM Standard Error of Mean	0.677
KM SD	1.483	95% KM (BCA) UCL	2.232
95% KM (t) UCL	2.387	95% KM (Percentile Bootstrap) UCL	2.297
95% KM (z) UCL	2.136	95% KM Bootstrap t UCL	6.245
90% KM Chebyshev UCL	3.053	95% KM Chebyshev UCL	3.973
97.5% KM Chebyshev UCL	5.249	99% KM Chebyshev UCL	7.756

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.425	Anderson-Darling GOF Test	
5% A-D Critical Value	0.698	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.302	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.367	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.766	k star (bias corrected MLE)	0.44
Theta hat (MLE)	1.573	Theta star (bias corrected MLE)	2.739
nu hat (MLE)	7.657	nu star (bias corrected)	4.396
Mean (detects)	1.204		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.005
Maximum	4.29	Median	0.44
SD	1.637	CV	1.628
k hat (MLE)	0.501	k star (bias corrected MLE)	0.362
Theta hat (MLE)	2.006	Theta star (bias corrected MLE)	2.78
nu hat (MLE)	6.012	nu star (bias corrected)	4.339
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (4.34, α)	0.86	Adjusted Chi Square Value (4.34, β)	0.434
95% Gamma Approximate UCL (use when n>=50)	5.071	95% Gamma Adjusted UCL (use when n<50)	10.04

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.023	SD (KM)	1.483
Variance (KM)	2.198	SE of Mean (KM)	0.677
k hat (KM)	0.476	k star (KM)	0.349
nu hat (KM)	5.713	nu star (KM)	4.19
theta hat (KM)	2.149	theta star (KM)	2.93
80% gamma percentile (KM)	1.619	90% gamma percentile (KM)	2.955
95% gamma percentile (KM)	4.452	99% gamma percentile (KM)	8.273

Off-Project Red Maple Swamp/Tidal Stream Area Hydric Soil

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (4.19, α)	0.798	Adjusted Chi Square Value (4.19, β)	0.397
95% Gamma Approximate KM-UCL (use when n>=50)	5.37	95% Gamma Adjusted KM-UCL (use when n<50)	10.8
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.944	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.219	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	1.006	Mean in Log Scale	-1.185
SD in Original Scale	1.636	SD in Log Scale	1.906
95% t UCL (assumes normality of ROS data)	2.352	95% Percentile Bootstrap UCL	2.28
95% BCA Bootstrap UCL	2.483	95% Bootstrap t UCL	6.247
95% H-UCL (Log ROS)	996.2		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.852	KM Geo Mean	0.426
KM SD (logged)	1.271	95% Critical H Value (KM-Log)	5.063
KM Standard Error of Mean (logged)	0.58	95% H-UCL (KM -Log)	16.98
KM SD (logged)	1.271	95% Critical H Value (KM-Log)	5.063
KM Standard Error of Mean (logged)	0.58		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.013	Mean in Log Scale	-0.968
SD in Original Scale	1.631	SD in Log Scale	1.541
95% t UCL (Assumes normality)	2.355	95% H-Stat UCL	79.56
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM Bootstrap t UCL	6.245	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n <	10.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_HS_VOCs|Carbon Disulfide|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	10
Number of Detects	2	Number of Non-Detects	4
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	0.0086	Minimum Non-Detect	0.0117
Maximum Detect	0.0186	Maximum Non-Detect	0.0694
Variance Detects	5.00E-05	Percent Non-Detects	66.67%
Mean Detects	0.0136	SD Detects	0.00707
Median Detects	0.0136	CV Detects	0.52
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-4.37	SD of Logged Detects	0.545

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0111	KM Standard Error of Mean	0.00306
KM SD	0.00433	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.0173	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.0161	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0203	95% KM Chebyshev UCL	0.0244
97.5% KM Chebyshev UCL	0.0302	99% KM Chebyshev UCL	0.0416

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	7.049	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00193	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	28.2	nu star (bias corrected)	N/A
Mean (detects)	0.0136		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0111	SD (KM)	0.00433
Variance (KM)	1.88E-05	SE of Mean (KM)	0.00306
k hat (KM)	6.571	k star (KM)	3.397
nu hat (KM)	78.85	nu star (KM)	40.76
theta hat (KM)	0.00169	theta star (KM)	0.00327
80% gamma percentile (KM)	0.0156	90% gamma percentile (KM)	0.0192
95% gamma percentile (KM)	0.0225	99% gamma percentile (KM)	0.0296

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0122
Approximate Chi Square Value (40.76, α)	27.13	Adjusted Chi Square Value (40.76, β)	23.19
95% Gamma Approximate KM-UCL (use when n>=50)	0.0167	95% Gamma Adjusted KM-UCL (use when n<50)	0.0195

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0108	Mean in Log Scale	-4.572
SD in Original Scale	0.0039	SD in Log Scale	0.299
95% t UCL (assumes normality of ROS data)	0.014	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	0.0146		

Off-Project Red Maple Swamp/Tidal Stream Area Hydric Soil

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.563	KM Geo Mean	0.0104
KM SD (logged)	0.334	95% Critical H Value (KM-Log)	2.287
KM Standard Error of Mean (logged)	0.236	95% H-UCL (KM -Log)	0.0155
KM SD (logged)	0.334	95% Critical H Value (KM-Log)	2.287
KM Standard Error of Mean (logged)	0.236		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0144	Mean in Log Scale	-4.441
SD in Original Scale	0.0109	SD in Log Scale	0.673
95% t UCL (Assumes normality)	0.0234	95% H-Stat UCL	0.0375

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	0.0244

Warning: Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL Input/Output
Off-Project Narragansett Bay and Beachfront Area Sediment

Off-Project Narragansett Bay and Beachfront Area Sediment

Matrix	Sediment	Location	Collected	Depth	RA_SE_Pest_PCBs|Total PCB Aroclors|mg/kg	D_RA_SE_Pest_PCBs|Total PCB Aroclors|mg/kg
SE	SE-OffProject_BeachFront	Beach-1-A	7/31/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	Beach-2-A	7/31/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	Beach-3-A	7/31/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	Beach-4-A	7/31/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	Beach-5-A	7/31/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	Beach-6-A	7/31/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	Beach-7-A	7/31/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	Beach-8-A	7/31/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	SED-301	10/3/2019 12:45 PM	0 - 1 ft	0.072	1
SE	SE-OffProject_BeachFront	SED-302	10/3/2019 1:00 PM	0 - 1 ft	0.071	1
SE	SE-OffProject_BeachFront	SED-303	10/3/2019 1:15 PM	0 - 1 ft	0.076	1
SE	SE-OffProject_BeachFront	SED-304	10/3/2019 1:30 PM	0 - 1 ft	0.077	1
SE	SE-OffProject_BeachFront	SED-305	10/3/2019 1:45 PM	0 - 1 ft	0.076	1
SE	SE-OffProject_BeachFront	SED-306	10/3/2019 2:00 PM	0 - 1 ft	0.076	1
SE	SE-OffProject_BeachFront	SED-307	10/3/2019 2:15 PM	0 - 1 ft	0.07	1
SE	SE-OffProject_BeachFront	SED-308	10/3/2019 2:30 PM	0 - 1 ft	0.071	1
SE	SE-OffProject_BeachFront	SED-309	10/3/2019 2:45 PM	0 - 1 ft	0.077	1
SE	SE-OffProject_BeachFront	SED-310	10/3/2019 3:00 PM	0 - 1 ft	0.083	1
SE	SE-OffProject_BeachFront	SED-OFF-10-090115	9/1/2015 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	SED-OFF-1-083115	8/31/2015 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	SED-OFF-2-083115	8/31/2015 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	SED-OFF-3-083115	8/31/2015 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	SED-OFF-4-083115	8/31/2015 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	SED-OFF-5-083115	8/31/2015 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	SED-OFF-6-083115	8/31/2015 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	SED-OFF-7-090115	9/1/2015 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	SED-OFF-8-090115	9/1/2015 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	SED-OFF-9-090115	9/1/2015 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	SED-ON-10-082515	8/25/2015 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_BeachFront	SED-ON-9-082515	8/25/2015 12:00 AM	0 - 0.5 ft		

Off-Project Narragansett Bay and Beachfront Area Sediment

Matrix	Sediment	Location	Collected	Depth	RA_SE_VOCs|Carbon Disulfide|mg/kg	D_RA_SE_VOCs|Carbon Disulfide|mg/kg
SE	SE-OffProject_BeachFront	Beach-1-A	7/31/2014 12:00 AM	0 - 0.5 ft	0.0025	0
SE	SE-OffProject_BeachFront	Beach-2-A	7/31/2014 12:00 AM	0 - 0.5 ft	0.0019	0
SE	SE-OffProject_BeachFront	Beach-3-A	7/31/2014 12:00 AM	0 - 0.5 ft	0.0027	0
SE	SE-OffProject_BeachFront	Beach-4-A	7/31/2014 12:00 AM	0 - 0.5 ft	0.0027	0
SE	SE-OffProject_BeachFront	Beach-5-A	7/31/2014 12:00 AM	0 - 0.5 ft	0.0017	0
SE	SE-OffProject_BeachFront	Beach-6-A	7/31/2014 12:00 AM	0 - 0.5 ft	0.0026	0
SE	SE-OffProject_BeachFront	Beach-7-A	7/31/2014 12:00 AM	0 - 0.5 ft	0.0025	0
SE	SE-OffProject_BeachFront	Beach-8-A	7/31/2014 12:00 AM	0 - 0.5 ft	0.0027	0
SE	SE-OffProject_BeachFront	SED-301	10/3/2019 12:45 PM	0 - 1 ft		
SE	SE-OffProject_BeachFront	SED-302	10/3/2019 1:00 PM	0 - 1 ft		
SE	SE-OffProject_BeachFront	SED-303	10/3/2019 1:15 PM	0 - 1 ft		
SE	SE-OffProject_BeachFront	SED-304	10/3/2019 1:30 PM	0 - 1 ft		
SE	SE-OffProject_BeachFront	SED-305	10/3/2019 1:45 PM	0 - 1 ft		
SE	SE-OffProject_BeachFront	SED-306	10/3/2019 2:00 PM	0 - 1 ft		
SE	SE-OffProject_BeachFront	SED-307	10/3/2019 2:15 PM	0 - 1 ft		
SE	SE-OffProject_BeachFront	SED-308	10/3/2019 2:30 PM	0 - 1 ft		
SE	SE-OffProject_BeachFront	SED-309	10/3/2019 2:45 PM	0 - 1 ft		
SE	SE-OffProject_BeachFront	SED-310	10/3/2019 3:00 PM	0 - 1 ft		
SE	SE-OffProject_BeachFront	SED-OFF-10-090115	9/1/2015 12:00 AM	0 - 0.5 ft	0.005	1
SE	SE-OffProject_BeachFront	SED-OFF-1-083115	8/31/2015 12:00 AM	0 - 0.5 ft	0.0114	1
SE	SE-OffProject_BeachFront	SED-OFF-2-083115	8/31/2015 12:00 AM	0 - 0.5 ft	0.0084	1
SE	SE-OffProject_BeachFront	SED-OFF-3-083115	8/31/2015 12:00 AM	0 - 0.5 ft	0.0079	1
SE	SE-OffProject_BeachFront	SED-OFF-4-083115	8/31/2015 12:00 AM	0 - 0.5 ft	0.0093	1
SE	SE-OffProject_BeachFront	SED-OFF-5-083115	8/31/2015 12:00 AM	0 - 0.5 ft	0.0105	1
SE	SE-OffProject_BeachFront	SED-OFF-6-083115	8/31/2015 12:00 AM	0 - 0.5 ft	0.0096	1
SE	SE-OffProject_BeachFront	SED-OFF-7-090115	9/1/2015 12:00 AM	0 - 0.5 ft	0.0028	1
SE	SE-OffProject_BeachFront	SED-OFF-8-090115	9/1/2015 12:00 AM	0 - 0.5 ft	0.0023	1
SE	SE-OffProject_BeachFront	SED-OFF-9-090115	9/1/2015 12:00 AM	0 - 0.5 ft	0.0029	1
SE	SE-OffProject_BeachFront	SED-ON-10-082515	8/25/2015 12:00 AM	0 - 0.5 ft	0.00058	0
SE	SE-OffProject_BeachFront	SED-ON-9-082515	8/25/2015 12:00 AM	0 - 0.5 ft	0.00083	1

Off-Project Narragansett Bay and Beachfront Area Sediment

RA_SE_Pest_PCBs|Total PCB Aroclors|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	6
		Number of Missing Observations	8
Minimum	0.07	Mean	0.0749
Maximum	0.083	Median	0.076
SD	0.00396	Std. Error of Mean	0.00125
Coefficient of Variation	0.0528	Skewness	0.658

Normal GOF Test

Shapiro Wilk Test Statistic	0.892	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.209	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.0772	95% Adjusted-CLT UCL (Chen-1995)	0.0772
		95% Modified-t UCL (Johnson-1978)	0.0772

Gamma GOF Test

A-D Test Statistic	0.554	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.724	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.222	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	404.5	k star (bias corrected MLE)	283.2
Theta hat (MLE)	1.85E-04	Theta star (bias corrected MLE)	2.64E-04
nu hat (MLE)	8090	nu star (bias corrected)	5664
MLE Mean (bias corrected)	0.0749	MLE Sd (bias corrected)	0.00445
		Approximate Chi Square Value (0.05)	5490
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	5460

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	0.0773	95% Adjusted Gamma UCL (use when n<50)	0.0777

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.898	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.219	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.659	Mean of logged Data	-2.593
Maximum of Logged Data	-2.489	SD of logged Data	0.0522

Assuming Lognormal Distribution

95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	0.0786
95% Chebyshev (MVUE) UCL	0.0803	97.5% Chebyshev (MVUE) UCL	0.0826
99% Chebyshev (MVUE) UCL	0.0872		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.077	95% Jackknife UCL	0.0772
95% Standard Bootstrap UCL	0.0769	95% Bootstrap-t UCL	0.0775
95% Hall's Bootstrap UCL	0.0776	95% Percentile Bootstrap UCL	0.0769
95% BCA Bootstrap UCL	0.077		
90% Chebyshev(Mean, Sd) UCL	0.0787	95% Chebyshev(Mean, Sd) UCL	0.0804
97.5% Chebyshev(Mean, Sd) UCL	0.0827	99% Chebyshev(Mean, Sd) UCL	0.0873

Suggested UCL to Use

95% Student's-t UCL	0.0772

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.110/9/2020 4:35:41 PM
From File	SD input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_SE_VOCs|Carbon Disulfide|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	17
		Number of Missing Observations	10
Number of Detects	11	Number of Non-Detects	9
Number of Distinct Detects	11	Number of Distinct Non-Detects	6
Minimum Detect	8.30E-04	Minimum Non-Detect	5.80E-04
Maximum Detect	0.0114	Maximum Non-Detect	0.0027
Variance Detects	1.42E-05	Percent Non-Detects	45%
Mean Detects	0.00645	SD Detects	0.00376
Median Detects	0.0079	CV Detects	0.584
Skewness Detects	-0.211	Kurtosis Detects	-1.713
Mean of Logged Detects	-5.288	SD of Logged Detects	0.835

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.905	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.196	Lilliefors GOF Test
5% Lilliefors Critical Value	0.251	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.00395	KM Standard Error of Mean	9.12E-04
KM SD	0.00385	95% KM (BCA) UCL	0.00554
95% KM (t) UCL	0.00553	95% KM (Percentile Bootstrap) UCL	0.00546
95% KM (z) UCL	0.00545	95% KM Bootstrap t UCL	0.00562
90% KM Chebyshev UCL	0.00669	95% KM Chebyshev UCL	0.00793
97.5% KM Chebyshev UCL	0.00965	99% KM Chebyshev UCL	0.013

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.594	Anderson-Darling GOF Test
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.249	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.258	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.205	k star (bias corrected MLE)	1.664
Theta hat (MLE)	0.00292	Theta star (bias corrected MLE)	0.00387
nu hat (MLE)	48.51	nu star (bias corrected)	36.61
Mean (detects)	0.00645		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	8.30E-04	Mean	0.00805
Maximum	0.0114	Median	0.01
SD	0.00328	CV	0.407
k hat (MLE)	3.323	k star (bias corrected MLE)	2.858
Theta hat (MLE)	0.00242	Theta star (bias corrected MLE)	0.00282
nu hat (MLE)	132.9	nu star (bias corrected)	114.3
Adjusted Level of Significance (β)	0.038		
Approximate Chi Square Value (114.30, α)	90.62	Adjusted Chi Square Value (114.30, β)	88.96
95% Gamma Approximate UCL (use when n>=50)	0.0101	95% Gamma Adjusted UCL (use when n<50)	0.0103

Off-Project Narragansett Bay and Beachfront Area Sediment

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00395	SD (KM)	0.00385
Variance (KM)	1.48E-05	SE of Mean (KM)	9.12E-04
k hat (KM)	1.054	k star (KM)	0.929
nu hat (KM)	42.14	nu star (KM)	37.15
theta hat (KM)	0.00375	theta star (KM)	0.00426
80% gamma percentile (KM)	0.0064	90% gamma percentile (KM)	0.00927
95% gamma percentile (KM)	0.0122	99% gamma percentile (KM)	0.0189

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (37.15, α)	24.2	Adjusted Chi Square Value (37.15, β)	23.37
95% Gamma Approximate KM-UCL (use when n>=50)	0.00607	95% Gamma Adjusted KM-UCL (use when n<50)	0.00628

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.861	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.249	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00399	Mean in Log Scale	-6.061
SD in Original Scale	0.00392	SD in Log Scale	1.1
95% t UCL (assumes normality of ROS data)	0.0055	95% Percentile Bootstrap UCL	0.00544
95% BCA Bootstrap UCL	0.00545	95% Bootstrap t UCL	0.00579
95% H-UCL (Log ROS)	0.00861		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-6.118	KM Geo Mean	0.0022
KM SD (logged)	1.132	95% Critical H Value (KM-Log)	2.831
KM Standard Error of Mean (logged)	0.285	95% H-UCL (KM -Log)	0.00872
KM SD (logged)	1.132	95% Critical H Value (KM-Log)	2.831
KM Standard Error of Mean (logged)	0.285		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.00404	Mean in Log Scale	-6.009
SD in Original Scale	0.00387	SD in Log Scale	1.068
95% t UCL (Assumes normality)	0.00554	95% H-Stat UCL	0.0085

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.00553

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL Input/Output
Off-Project Red Maple Swamp / Tidal Stream Area Sediment

Off-Project Red Maple Swamp / Tidal Stream Area Sediment

Matrix	Sediment	Location	Collected	Depth	RA_SE_Pest_PCBs|Total PCB Aroclors|mg/kg	D_RA_SE_Pest_PCBs|Total PCB Aroclors|mg/kg
SE	SE-OffProject_RedMapleSwamp	SED 3	11/30/2011 12:00 AM	0 - 0.5 ft	0.69	0
SE	SE-OffProject_RedMapleSwamp	SED 4	11/29/2011 12:00 AM	0 - 0.5 ft	0.63	1
SE	SE-OffProject_RedMapleSwamp	SED 5	11/29/2011 12:00 AM	0 - 0.5 ft	0.41	1
SE	SE-OffProject_RedMapleSwamp	SED-103-2014	8/5/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-104-2014	8/5/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-105-2014	8/5/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-326	10/1/2019 1:50 PM	0 - 0.5 ft	0.072	0
SE	SE-OffProject_RedMapleSwamp	SED-327	10/1/2019 2:15 PM	0 - 0.5 ft	0.066	0
SE	SE-OffProject_RedMapleSwamp	SED-328	10/1/2019 2:45 PM	0 - 0.5 ft	0.39	0
SE	SE-OffProject_RedMapleSwamp	SED-329	10/1/2019 3:05 PM	0 - 0.5 ft	0.087	0
SE	SE-OffProject_RedMapleSwamp	SED-330	10/1/2019 3:30 PM	0 - 0.5 ft	0.084	1
SE	SE-OffProject_RedMapleSwamp	SED-331	10/2/2019 2:30 PM	0 - 0.5 ft	0.49	0
SE	SE-OffProject_RedMapleSwamp	SED-331	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-332	10/2/2019 2:00 PM	0 - 0.5 ft	0.52	0
SE	SE-OffProject_RedMapleSwamp	SED-333	10/2/2019 1:30 PM	0 - 0.5 ft	0.16	0
SE	SE-OffProject_RedMapleSwamp	SED-333	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-334	10/2/2019 1:00 PM	0 - 0.5 ft	0.37	1
SE	SE-OffProject_RedMapleSwamp	SED-335	10/2/2019 12:30 PM	0 - 0.5 ft	1.5	1
SE	SE-OffProject_RedMapleSwamp	SED-335	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-336	10/2/2019 10:10 AM	0 - 0.5 ft	0.48	1
SE	SE-OffProject_RedMapleSwamp	SED-337	10/2/2019 9:30 AM	0 - 0.5 ft	0.27	1
SE	SE-OffProject_RedMapleSwamp	SED-337	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-338	10/2/2019 10:00 AM	0 - 0.5 ft	0.23	1
SE	SE-OffProject_RedMapleSwamp	SED-339	10/2/2019 9:20 AM	0 - 0.5 ft	0.1	1
SE	SE-OffProject_RedMapleSwamp	SED-339	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-340	10/2/2019 8:45 AM	0 - 0.5 ft	0.12	1

Off-Project Red Maple Swamp / Tidal Stream Area Sediment

Matrix	Sediment	Location	Collected	Depth	RA_SE_SVOCs|Bis-(2-Ethylhexyl)-Phthalate|mg/kg	D_RA_SE_SVOCs|Bis-(2-Ethylhexyl)-Phthalate|mg/kg
SE	SE-OffProject_RedMapleSwamp	SED 3	11/30/2011 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED 4	11/29/2011 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED 5	11/29/2011 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-103-2014	8/5/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-104-2014	8/5/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-105-2014	8/5/2014 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-326	10/1/2019 1:50 PM	0 - 0.5 ft	0.31	0
SE	SE-OffProject_RedMapleSwamp	SED-327	10/1/2019 2:15 PM	0 - 0.5 ft	0.29	0
SE	SE-OffProject_RedMapleSwamp	SED-328	10/1/2019 2:45 PM	0 - 0.5 ft	0.16	1
SE	SE-OffProject_RedMapleSwamp	SED-329	10/1/2019 3:05 PM	0 - 0.5 ft	0.33	0
SE	SE-OffProject_RedMapleSwamp	SED-330	10/1/2019 3:30 PM	0 - 0.5 ft	0.3	0
SE	SE-OffProject_RedMapleSwamp	SED-331	10/2/2019 2:30 PM	0 - 0.5 ft	19	0
SE	SE-OffProject_RedMapleSwamp	SED-331	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-332	10/2/2019 2:00 PM	0 - 0.5 ft	2.1	0
SE	SE-OffProject_RedMapleSwamp	SED-333	10/2/2019 1:30 PM	0 - 0.5 ft	0.53	0
SE	SE-OffProject_RedMapleSwamp	SED-333	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-334	10/2/2019 1:00 PM	0 - 0.5 ft	0.85	0
SE	SE-OffProject_RedMapleSwamp	SED-335	10/2/2019 12:30 PM	0 - 0.5 ft	2.2	1
SE	SE-OffProject_RedMapleSwamp	SED-335	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-336	10/2/2019 10:10 AM	0 - 0.5 ft	0.97	0
SE	SE-OffProject_RedMapleSwamp	SED-337	10/2/2019 9:30 AM	0 - 0.5 ft	0.18	1
SE	SE-OffProject_RedMapleSwamp	SED-337	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-338	10/2/2019 10:00 AM	0 - 0.5 ft	0.38	0
SE	SE-OffProject_RedMapleSwamp	SED-339	10/2/2019 9:20 AM	0 - 0.5 ft	0.29	1
SE	SE-OffProject_RedMapleSwamp	SED-339	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-340	10/2/2019 8:45 AM	0 - 0.5 ft	0.11	1

Off-Project Red Maple Swamp / Tidal Stream Area Sediment

Matrix	Sediment	Location	Collected	Depth	RA_SE_VOCs|2-Butanone (MEK)|mg/kg	D_RA_SE_VOCs|2-Butanone (MEK)|mg/kg
SE	SE-OffProject_RedMapleSwamp	SED 3	11/30/2011 12:00 AM	0 - 0.5 ft	0.0282	1
SE	SE-OffProject_RedMapleSwamp	SED 4	11/29/2011 12:00 AM	0 - 0.5 ft	0.0083	1
SE	SE-OffProject_RedMapleSwamp	SED 5	11/29/2011 12:00 AM	0 - 0.5 ft	0.0319	0
SE	SE-OffProject_RedMapleSwamp	SED-103-2014	8/5/2014 12:00 AM	0 - 0.5 ft	0.0175	1
SE	SE-OffProject_RedMapleSwamp	SED-104-2014	8/5/2014 12:00 AM	0 - 0.5 ft	0.0422	1
SE	SE-OffProject_RedMapleSwamp	SED-105-2014	8/5/2014 12:00 AM	0 - 0.5 ft	0.0096	1
SE	SE-OffProject_RedMapleSwamp	SED-326	10/1/2019 1:50 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-327	10/1/2019 2:15 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-328	10/1/2019 2:45 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-329	10/1/2019 3:05 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-330	10/1/2019 3:30 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-331	10/2/2019 2:30 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-331	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-332	10/2/2019 2:00 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-333	10/2/2019 1:30 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-333	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-334	10/2/2019 1:00 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-335	10/2/2019 12:30 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-335	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-336	10/2/2019 10:10 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-337	10/2/2019 9:30 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-337	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-338	10/2/2019 10:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-339	10/2/2019 9:20 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-339	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-340	10/2/2019 8:45 AM	0 - 0.5 ft		

Off-Project Red Maple Swamp / Tidal Stream Area Sediment

Matrix	Sediment	Location	Collected	Depth	RA_SE_VOCs|Acetone|mg/kg	D_RA_SE_VOCs|Acetone|mg/kg
SE	SE-OffProject_RedMapleSwamp	SED 3	11/30/2011 12:00 AM	0 - 0.5 ft	0.0485	0
SE	SE-OffProject_RedMapleSwamp	SED 4	11/29/2011 12:00 AM	0 - 0.5 ft	0.158	1
SE	SE-OffProject_RedMapleSwamp	SED 5	11/29/2011 12:00 AM	0 - 0.5 ft	0.0319	0
SE	SE-OffProject_RedMapleSwamp	SED-103-2014	8/5/2014 12:00 AM	0 - 0.5 ft	0.12	1
SE	SE-OffProject_RedMapleSwamp	SED-104-2014	8/5/2014 12:00 AM	0 - 0.5 ft	0.283	1
SE	SE-OffProject_RedMapleSwamp	SED-105-2014	8/5/2014 12:00 AM	0 - 0.5 ft	0.061	1
SE	SE-OffProject_RedMapleSwamp	SED-326	10/1/2019 1:50 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-327	10/1/2019 2:15 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-328	10/1/2019 2:45 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-329	10/1/2019 3:05 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-330	10/1/2019 3:30 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-331	10/2/2019 2:30 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-331	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-332	10/2/2019 2:00 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-333	10/2/2019 1:30 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-333	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-334	10/2/2019 1:00 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-335	10/2/2019 12:30 PM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-335	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-336	10/2/2019 10:10 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-337	10/2/2019 9:30 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-337	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-338	10/2/2019 10:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-339	10/2/2019 9:20 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-339	5/28/2020 12:00 AM	0 - 0.5 ft		
SE	SE-OffProject_RedMapleSwamp	SED-340	10/2/2019 8:45 AM	0 - 0.5 ft		

Off-Project Red Maple Swamp/Tidal Stream Sediment

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/30/2020 4:01:39 PM
From File	UCL_Input_c.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_SE_Pest_PCBs|Total PCB Aroclors|mg/kg

General Statistics

Total Number of Observations	18	Number of Distinct Observations	18
		Number of Missing Observations	8
Number of Detects	10	Number of Non-Detects	8
Number of Distinct Detects	10	Number of Distinct Non-Detects	8
Minimum Detect	0.084	Minimum Non-Detect	0.066
Maximum Detect	1.5	Maximum Non-Detect	0.69
Variance Detects	0.176	Percent Non-Detects	44.44%
Mean Detects	0.419	SD Detects	0.419
Median Detects	0.32	CV Detects	0.999
Skewness Detects	2.197	Kurtosis Detects	5.556
Mean of Logged Detects	-1.236	SD of Logged Detects	0.897

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.752	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.243	Lilliefors GOF Test
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.291	KM Standard Error of Mean	0.0862
KM SD	0.339	95% KM (BCA) UCL	0.455
95% KM (t) UCL	0.441	95% KM (Percentile Bootstrap) UCL	0.43
95% KM (z) UCL	0.433	95% KM Bootstrap t UCL	0.558
90% KM Chebyshev UCL	0.549	95% KM Chebyshev UCL	0.667
97.5% KM Chebyshev UCL	0.829	99% KM Chebyshev UCL	1.149

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.299	Anderson-Darling GOF Test
5% A-D Critical Value	0.739	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.137	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.271	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.509	k star (bias corrected MLE)	1.123
Theta hat (MLE)	0.278	Theta star (bias corrected MLE)	0.373
nu hat (MLE)	30.18	nu star (bias corrected)	22.46
Mean (detects)	0.419		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.253
Maximum	1.5	Median	0.106
SD	0.361	CV	1.427
k hat (MLE)	0.664	k star (bias corrected MLE)	0.59
Theta hat (MLE)	0.381	Theta star (bias corrected MLE)	0.429
nu hat (MLE)	23.9	nu star (bias corrected)	21.25
Adjusted Level of Significance (β)	0.0357		
Approximate Chi Square Value (21.25, α)	11.78	Adjusted Chi Square Value (21.25, β)	11.11
95% Gamma Approximate UCL (use when n>=50)	0.456	95% Gamma Adjusted UCL (use when n<50)	0.484

Off-Project Red Maple Swamp/Tidal Stream Sediment

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.291	SD (KM)	0.339
Variance (KM)	0.115	SE of Mean (KM)	0.0862
k hat (KM)	0.737	k star (KM)	0.651
nu hat (KM)	26.53	nu star (KM)	23.44
theta hat (KM)	0.395	theta star (KM)	0.447
80% gamma percentile (KM)	0.479	90% gamma percentile (KM)	0.742
95% gamma percentile (KM)	1.016	99% gamma percentile (KM)	1.673

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (23.44, α)	13.42	Adjusted Chi Square Value (23.44, β)	12.7
95% Gamma Approximate KM-UCL (use when n>=50)	0.508	95% Gamma Adjusted KM-UCL (use when n<50)	0.537

Off-Project Red Maple Swamp/Tidal Stream Sediment

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.962	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.138	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.273	Mean in Log Scale	-1.809
SD in Original Scale	0.349	SD in Log Scale	0.993
95% t UCL (assumes normality of ROS data)	0.417	95% Percentile Bootstrap UCL	0.424
95% BCA Bootstrap UCL	0.492	95% Bootstrap t UCL	0.577
95% H-UCL (Log ROS)	0.506		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.707	KM Geo Mean	0.181
KM SD (logged)	0.926	95% Critical H Value (KM-Log)	2.531
KM Standard Error of Mean (logged)	0.25	95% H-UCL (KM -Log)	0.491
KM SD (logged)	0.926	95% Critical H Value (KM-Log)	2.531
KM Standard Error of Mean (logged)	0.25		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.302	Mean in Log Scale	-1.678
SD in Original Scale	0.343	SD in Log Scale	1.038
95% t UCL (Assumes normality)	0.442	95% H-Stat UCL	0.631

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.441

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_SE_VOCs|2-Butanone (MEK)|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	1
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	0.0083	Minimum Non-Detect	0.0319
Maximum Detect	0.0422	Maximum Non-Detect	0.0319
Variance Detects	2.01E-04	Percent Non-Detects	16.67%
Mean Detects	0.0212	SD Detects	0.0142
Median Detects	0.0175	CV Detects	0.67
Skewness Detects	0.868	Kurtosis Detects	-0.469
Mean of Logged Detects	-4.043	SD of Logged Detects	0.693

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.907	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.202	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0203	KM Standard Error of Mean	0.0058
KM SD	0.0122	95% KM (BCA) UCL	0.0293
95% KM (t) UCL	0.032	95% KM (Percentile Bootstrap) UCL	0.0299
95% KM (z) UCL	0.0298	95% KM Bootstrap t UCL	0.0418
90% KM Chebyshev UCL	0.0377	95% KM Chebyshev UCL	0.0456
97.5% KM Chebyshev UCL	0.0565	99% KM Chebyshev UCL	0.078

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.283	Anderson-Darling GOF Test	
5% A-D Critical Value	0.683	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.232	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.36	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.819	k star (bias corrected MLE)	1.261
Theta hat (MLE)	0.00751	Theta star (bias corrected MLE)	0.0168
nu hat (MLE)	28.19	nu star (bias corrected)	12.61
Mean (detects)	0.0212		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0083	Mean	0.0202
Maximum	0.0422	Median	0.0164
SD	0.0129	CV	0.64
k hat (MLE)	3.219	k star (bias corrected MLE)	1.721
Theta hat (MLE)	0.00627	Theta star (bias corrected MLE)	0.0117
nu hat (MLE)	38.63	nu star (bias corrected)	20.65
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (20.65, α)	11.33	Adjusted Chi Square Value (20.65, β)	8.944
95% Gamma Approximate UCL (use when n>=50)	0.0368	95% Gamma Adjusted UCL (use when n<50)	0.0466

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0203	SD (KM)	0.0122
Variance (KM)	1.48E-04	SE of Mean (KM)	0.0058
k hat (KM)	2.772	k star (KM)	1.497
nu hat (KM)	33.26	nu star (KM)	17.96
theta hat (KM)	0.00732	theta star (KM)	0.0135
80% gamma percentile (KM)	0.0314	90% gamma percentile (KM)	0.0423
95% gamma percentile (KM)	0.0529	99% gamma percentile (KM)	0.0768

Off-Project Red Maple Swamp/Tidal Stream Sediment

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (17.96, α)	9.365	Adjusted Chi Square Value (17.96, β)	7.236
95% Gamma Approximate KM-UCL (use when n>=50)	0.0389	95% Gamma Adjusted KM-UCL (use when n<50)	0.0504

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.937	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.208	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.02	Mean in Log Scale	-4.08
SD in Original Scale	0.013	SD in Log Scale	0.626
95% t UCL (assumes normality of ROS data)	0.0307	95% Percentile Bootstrap UCL	0.0288
95% BCA Bootstrap UCL	0.0298	95% Bootstrap t UCL	0.0439
95% H-UCL (Log ROS)	0.0471		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-4.08	KM Geo Mean	0.0169
KM SD (logged)	0.605	95% Critical H Value (KM-Log)	2.906
KM Standard Error of Mean (logged)	0.294	95% H-UCL (KM -Log)	0.0446
KM SD (logged)	0.605	95% Critical H Value (KM-Log)	2.906
KM Standard Error of Mean (logged)	0.294		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0203	Mean in Log Scale	-4.059
SD in Original Scale	0.0129	SD in Log Scale	0.621
95% t UCL (Assumes normality)	0.0309	95% H-Stat UCL	0.0475
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use
95% KM (t) UCL 0.032

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_SE_VOCs|Acetone|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
Number of Detects	4	Number of Non-Detects	2
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	0.061	Minimum Non-Detect	0.0319
Maximum Detect	0.283	Maximum Non-Detect	0.0485
Variance Detects	0.00882	Percent Non-Detects	33.33%
Mean Detects	0.156	SD Detects	0.0939
Median Detects	0.139	CV Detects	0.604
Skewness Detects	0.953	Kurtosis Detects	1.317
Mean of Logged Detects	-2.006	SD of Logged Detects	0.637

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.955	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.239	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.114	KM Standard Error of Mean	0.0416
KM SD	0.0883	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.198	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.183	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.239	95% KM Chebyshev UCL	0.296
97.5% KM Chebyshev UCL	0.374	99% KM Chebyshev UCL	0.529

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.205	Anderson-Darling GOF Test	
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.174	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.605	k star (bias corrected MLE)	1.068
Theta hat (MLE)	0.0431	Theta star (bias corrected MLE)	0.146
nu hat (MLE)	28.84	nu star (bias corrected)	8.544
Mean (detects)	0.156		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.107
Maximum	0.283	Median	0.0905
SD	0.105	CV	0.977
k hat (MLE)	0.915	k star (bias corrected MLE)	0.569
Theta hat (MLE)	0.117	Theta star (bias corrected MLE)	0.188
nu hat (MLE)	10.98	nu star (bias corrected)	6.824
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (6.82, α)	2.074	Adjusted Chi Square Value (6.82, β)	1.261
95% Gamma Approximate UCL (use when n>=50)	0.352	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.114	SD (KM)	0.0883
Variance (KM)	0.0078	SE of Mean (KM)	0.0416
k hat (KM)	1.674	k star (KM)	0.948
nu hat (KM)	20.09	nu star (KM)	11.38
theta hat (KM)	0.0683	theta star (KM)	0.121
80% gamma percentile (KM)	0.185	90% gamma percentile (KM)	0.267
95% gamma percentile (KM)	0.349	99% gamma percentile (KM)	0.541

Off-Project Red Maple Swamp/Tidal Stream Sediment

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.38, α)	4.82	Adjusted Chi Square Value (11.38, β)	3.403
95% Gamma Approximate KM-UCL (use when n>=50)	0.27	95% Gamma Adjusted KM-UCL (use when n<50)	0.382

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.995	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.179	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.111	Mean in Log Scale	-2.595
SD in Original Scale	0.0999	SD in Log Scale	1.037
95% t UCL (assumes normality of ROS data)	0.193	95% Percentile Bootstrap UCL	0.175
95% BCA Bootstrap UCL	0.184	95% Bootstrap t UCL	0.221
95% H-UCL (Log ROS)	0.921		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.486	KM Geo Mean	0.0833
KM SD (logged)	0.814	95% Critical H Value (KM-Log)	3.52
KM Standard Error of Mean (logged)	0.384	95% H-UCL (KM -Log)	0.418
KM SD (logged)	0.814	95% Critical H Value (KM-Log)	3.52
KM Standard Error of Mean (logged)	0.384		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.11	Mean in Log Scale	-2.647
SD in Original Scale	0.101	SD in Log Scale	1.117
95% t UCL (Assumes normality)	0.193	95% H-Stat UCL	1.273

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.198

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Off-Project Red Maple Swamp/Tidal Stream Sediment

RA_SE_VOCs|Carbon Disulfide|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
Number of Detects	3	Number of Non-Detects	3
Number of Distinct Detects	3	Number of Distinct Non-Detects	3
Minimum Detect	0.0028	Minimum Non-Detect	0.0032
Maximum Detect	0.0134	Maximum Non-Detect	0.005
Variance Detects	3.32E-05	Percent Non-Detects	50%
Mean Detects	0.0068	SD Detects	0.00576
Median Detects	0.0042	CV Detects	0.847
Skewness Detects	1.618	Kurtosis Detects	N/A
Mean of Logged Detects	-5.221	SD of Logged Detects	0.813

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.847	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.341	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.00496	KM Standard Error of Mean	0.00193
KM SD	0.00382	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.00884	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.00813	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.0107	95% KM Chebyshev UCL	0.0134
97.5% KM Chebyshev UCL	0.017	99% KM Chebyshev UCL	0.0241

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2.324	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.00293	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	13.95	nu star (bias corrected)	N/A
Mean (detects)	0.0068		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0028	Mean	0.0084
Maximum	0.0134	Median	0.01
SD	0.00404	CV	0.481
k hat (MLE)	3.901	k star (bias corrected MLE)	2.062
Theta hat (MLE)	0.00215	Theta star (bias corrected MLE)	0.00407
nu hat (MLE)	46.81	nu star (bias corrected)	24.74
Adjusted Level of Significance (β)	0.0122		
Approximate Chi Square Value (24.74, α)	14.41	Adjusted Chi Square Value (24.74, β)	11.67
95% Gamma Approximate UCL (use when n>=50)	0.0144	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00496	SD (KM)	0.00382
Variance (KM)	1.46E-05	SE of Mean (KM)	0.00193
k hat (KM)	1.679	k star (KM)	0.951
nu hat (KM)	20.15	nu star (KM)	11.41
theta hat (KM)	0.00295	theta star (KM)	0.00521
80% gamma percentile (KM)	0.00801	90% gamma percentile (KM)	0.0116
95% gamma percentile (KM)	0.0151	99% gamma percentile (KM)	0.0234

Off-Project Red Maple Swamp/Tidal Stream Sediment

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.41, α)	4.84	Adjusted Chi Square Value (11.41, β)	3.419
95% Gamma Approximate KM-UCL (use when n>=50)	0.0117	95% Gamma Adjusted KM-UCL (use when n<50)	0.0165

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.928	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.288	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0049	Mean in Log Scale	-5.52
SD in Original Scale	0.00421	SD in Log Scale	0.619
95% t UCL (assumes normality of ROS data)	0.00836	95% Percentile Bootstrap UCL	0.0082
95% BCA Bootstrap UCL	0.00851	95% Bootstrap t UCL	0.0266
95% H-UCL (Log ROS)	0.011		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.505	KM Geo Mean	0.00407
KM SD (logged)	0.561	95% Critical H Value (KM-Log)	2.789
KM Standard Error of Mean (logged)	0.289	95% H-UCL (KM -Log)	0.00958
KM SD (logged)	0.561	95% Critical H Value (KM-Log)	2.789
KM Standard Error of Mean (logged)	0.289		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.00448	Mean in Log Scale	-5.687
SD in Original Scale	0.00445	SD in Log Scale	0.741
95% t UCL (Assumes normality)	0.00814	95% H-Stat UCL	0.0133

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.00884

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL Input/Output
Off-Project Red Maple Swamp / Tidal Stream Area Surface Water

Off-Project Red Maple Swamp/Tidal Stream Area Surface Water

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_WS_Metals|Barium|ug/l	D_RA_WS_Metals|Barium|ug/l
WS	D	SW-OffProject_RedMapleSwamp	SW-103-2014	7/31/2014 12:00 AM	0.5 - 0.5 ft	14.5	1
WS	D	SW-OffProject_RedMapleSwamp	SW-104-2014	7/31/2014 12:00 AM	0.2 - 0.2 ft	16.2	1
WS	D	SW-OffProject_RedMapleSwamp	SW-105-2014	7/31/2014 12:00 AM	0.7 - 0.7 ft	9.7	1
WS	D	SW-OffProject_RedMapleSwamp	SW-1A	11/30/2011 12:00 AM	0.25 - 0.25 ft	6.2	1
WS	D	SW-OffProject_RedMapleSwamp	SW-3A	11/30/2011 12:00 AM	0.5 - 0.5 ft	14	1
WS	D	SW-OffProject_RedMapleSwamp	SW-4A	11/29/2011 12:00 AM	0.15 - 0.15 ft	4.7	1
WS	D	SW-OffProject_RedMapleSwamp	SW-5A	11/29/2011 12:00 AM	0.35 - 0.35 ft	4.1	1
WS	T	SW-OffProject_RedMapleSwamp	SW-103-2014	7/31/2014 12:00 AM	0.5 - 0.5 ft	13.1	1
WS	T	SW-OffProject_RedMapleSwamp	SW-103-2014	7/31/2014 12:00 AM	0.5 - 0.5 ft		
WS	T	SW-OffProject_RedMapleSwamp	SW-104-2014	7/31/2014 12:00 AM	0.2 - 0.2 ft	13.5	1
WS	T	SW-OffProject_RedMapleSwamp	SW-104-2014	7/31/2014 12:00 AM	0.2 - 0.2 ft		
WS	T	SW-OffProject_RedMapleSwamp	SW-105-2014	7/31/2014 12:00 AM	0.7 - 0.7 ft	9.7	1
WS	T	SW-OffProject_RedMapleSwamp	SW-105-2014	7/31/2014 12:00 AM	0.7 - 0.7 ft		
WS	T	SW-OffProject_RedMapleSwamp	SW-1A	11/30/2011 12:00 AM	0.25 - 0.25 ft	6.2	1
WS	T	SW-OffProject_RedMapleSwamp	SW-3A	11/30/2011 12:00 AM	0.5 - 0.5 ft	13.2	1
WS	T	SW-OffProject_RedMapleSwamp	SW-4A	11/29/2011 12:00 AM	0.15 - 0.15 ft	4.7	1
WS	T	SW-OffProject_RedMapleSwamp	SW-5A	11/29/2011 12:00 AM	0.35 - 0.35 ft	4.2	1

Off-Project Red Maple Swamp/Tidal Stream Area Surface Water

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.110/9/2020 2:49:05 PM
From File	sw input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_WS_Metals|Barium_Diss|ug/l

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	4.1	Mean	9.914
Maximum	16.2	Median	9.7
SD	5.034	Std. Error of Mean	1.903
Coefficient of Variation	0.508	Skewness	0.0428

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.886	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.22	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	13.61	95% Adjusted-CLT UCL (Chen-1995)	13.08
		95% Modified-t UCL (Johnson-1978)	13.62

Gamma GOF Test

A-D Test Statistic	0.442	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.71	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.244	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.313	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.029	k star (bias corrected MLE)	2.398
Theta hat (MLE)	2.461	Theta star (bias corrected MLE)	4.135
nu hat (MLE)	56.41	nu star (bias corrected)	33.57
MLE Mean (bias corrected)	9.914	MLE Sd (bias corrected)	6.403
		Approximate Chi Square Value (0.05)	21.32
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	18.43

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	15.61	95% Adjusted Gamma UCL (use when n<50)	18.06

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.885	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.226	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.411	Mean of logged Data	2.165
Maximum of Logged Data	2.785	SD of logged Data	0.569

Assuming Lognormal Distribution

95% H-UCL	18.78	90% Chebyshev (MVUE) UCL	16.47
95% Chebyshev (MVUE) UCL	19.41	97.5% Chebyshev (MVUE) UCL	23.49
99% Chebyshev (MVUE) UCL	31.5		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Off-Project Red Maple Swamp/Tidal Stream Area Surface Water

Nonparametric Distribution Free UCLs

95% CLT UCL	13.04	95% Jackknife UCL	13.61
95% Standard Bootstrap UCL	12.91	95% Bootstrap-t UCL	13.77
95% Hall's Bootstrap UCL	12.22	95% Percentile Bootstrap UCL	12.76
95% BCA Bootstrap UCL	12.76		
90% Chebyshev(Mean, Sd) UCL	15.62	95% Chebyshev(Mean, Sd) UCL	18.21
97.5% Chebyshev(Mean, Sd) UCL	21.8	99% Chebyshev(Mean, Sd) UCL	28.85

Suggested UCL to Use

95% Student's-t UCL	13.61

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.110/9/2020 2:54:03 PM
From File	sw input_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_WS_Metals|Barium_Total|ug/l

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	3
Minimum	4.2	Mean	9.229
Maximum	13.5	Median	9.7
SD	4.167	Std. Error of Mean	1.575
Coefficient of Variation	0.452	Skewness	-0.158

Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1

Normal GOF Test

Shapiro Wilk Test Statistic	0.837	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.252	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	12.29	95% Adjusted-CLT UCL (Chen-1995)	11.72
		95% Modified-t UCL (Johnson-1978)	12.27

Gamma GOF Test

A-D Test Statistic	0.577	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.71	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.265	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.313	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.013	k star (bias corrected MLE)	2.96
Theta hat (MLE)	1.841	Theta star (bias corrected MLE)	3.118
nu hat (MLE)	70.18	nu star (bias corrected)	41.44
MLE Mean (bias corrected)	9.229	MLE Sd (bias corrected)	5.364
		Approximate Chi Square Value (0.05)	27.68
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	24.34

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	13.81	95% Adjusted Gamma UCL (use when n<50)	15.71

Off-Project Red Maple Swamp/Tidal Stream Area Surface Water

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.843	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.242	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics			
Minimum of Logged Data	1.435	Mean of logged Data	2.119
Maximum of Logged Data	2.603	SD of logged Data	0.509

Assuming Lognormal Distribution			
95% H-UCL	15.89	90% Chebyshev (MVUE) UCL	14.68
95% Chebyshev (MVUE) UCL	17.13	97.5% Chebyshev (MVUE) UCL	20.52
99% Chebyshev (MVUE) UCL	27.18		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	11.82	95% Jackknife UCL	12.29
95% Standard Bootstrap UCL	11.6	95% Bootstrap-t UCL	12.31
95% Hall's Bootstrap UCL	11.05	95% Percentile Bootstrap UCL	11.7
95% BCA Bootstrap UCL	11.57		
90% Chebyshev(Mean, Sd) UCL	13.95	95% Chebyshev(Mean, Sd) UCL	16.09
97.5% Chebyshev(Mean, Sd) UCL	19.06	99% Chebyshev(Mean, Sd) UCL	24.9

Suggested UCL to Use	
95% Student's-t UCL	12.29

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

ProUCL Input/Output
Off-Project Red Maple Swamp / Tidal Stream Area Porewater

Off-Project Red Maple Swamp/Tidal Stream Area Porewater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_PW_Metals|Barium|ug/l	D_RA_PW_Metals|Barium|ug/l
PW	D	PW-OffProject_RedMapleSwamp	PW-101	11/28/2011 12:00 AM	0.75 - 1 ft	9.4	1
PW	D	PW-OffProject_RedMapleSwamp	PW-102	11/28/2011 12:00 AM	0.75 - 1 ft	18.4	1
PW	D	PW-OffProject_RedMapleSwamp	PW-103	11/28/2011 12:00 AM	0.75 - 1 ft	8.3	1
PW	D	PW-OffProject_RedMapleSwamp	PW-104	11/28/2011 12:00 AM	0.75 - 1 ft	10.6	1
PW	D	PW-OffProject_RedMapleSwamp	PW-105	11/28/2011 12:00 AM	0.75 - 1 ft	9.6	1
PW	D	PW-OffProject_RedMapleSwamp	PW-1-2014	7/30/2014 12:00 AM	2.7 - 3 ft	67.9	1
PW	D	PW-OffProject_RedMapleSwamp	PW-2-2014	7/30/2014 12:00 AM	2.7 - 3 ft	13.6	1
PW	D	PW-OffProject_RedMapleSwamp	PW-3-2014	7/30/2014 12:00 AM	2.7 - 3 ft	19	1
PW	D	PW-OffProject_RedMapleSwamp	PW-4-2014	7/29/2014 12:00 AM	2.7 - 3 ft	17.6	1
PW	D	PW-OffProject_RedMapleSwamp	PW-5-2014	7/29/2014 12:00 AM	2.7 - 3 ft	18.2	1
PW	T	PW-OffProject_RedMapleSwamp	PW-1	10/29/2008 12:00 AM	0.75 - 1 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-101	11/28/2011 12:00 AM	0.75 - 1 ft	9.8	1
PW	T	PW-OffProject_RedMapleSwamp	PW-102	11/28/2011 12:00 AM	0.75 - 1 ft	18.7	1
PW	T	PW-OffProject_RedMapleSwamp	PW-103	11/28/2011 12:00 AM	0.75 - 1 ft	8.4	1
PW	T	PW-OffProject_RedMapleSwamp	PW-104	11/28/2011 12:00 AM	0.75 - 1 ft	10.8	1
PW	T	PW-OffProject_RedMapleSwamp	PW-105	11/28/2011 12:00 AM	0.75 - 1 ft	9.3	1
PW	T	PW-OffProject_RedMapleSwamp	PW-1-2014	7/30/2014 12:00 AM	2.7 - 3 ft	67	1
PW	T	PW-OffProject_RedMapleSwamp	PW-1-2014	7/30/2014 12:00 AM	2.7 - 3 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-2-2014	7/30/2014 12:00 AM	2.7 - 3 ft	13.4	1
PW	T	PW-OffProject_RedMapleSwamp	PW-2-2014	7/30/2014 12:00 AM	2.7 - 3 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-3-2014	7/30/2014 12:00 AM	2.7 - 3 ft	18.4	1
PW	T	PW-OffProject_RedMapleSwamp	PW-3-2014	7/30/2014 12:00 AM	2.7 - 3 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-4-2014	7/29/2014 12:00 AM	2.7 - 3 ft	18	1
PW	T	PW-OffProject_RedMapleSwamp	PW-4-2014	7/29/2014 12:00 AM	2.7 - 3 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-5-2014	7/29/2014 12:00 AM	2.7 - 3 ft	18.4	1
PW	T	PW-OffProject_RedMapleSwamp	PW-5-2014	7/29/2014 12:00 AM	2.7 - 3 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-C	8/4/2014 12:00 AM	2.7 - 3 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-E	8/4/2014 12:00 AM	2.7 - 3 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-F	8/4/2014 12:00 AM	2.7 - 3 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-H	8/1/2014 12:00 AM	2.7 - 3 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-I	8/1/2014 12:00 AM	2.7 - 3 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-TS1A	8/4/2014 12:00 AM	2.7 - 3 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-TS1C	8/4/2014 12:00 AM	2.7 - 3 ft		

Off-Project Red Maple Swamp/Tidal Stream Area Porewater

Matrix	Fraction	Group-ID	Location	Collected	Depth	RA_PW_VOCs|Carbon Disulfide|ug/l	D_RA_PW_VOCs|Carbon Disulfide|ug/l
PW	D	PW-OffProject_RedMapleSwamp	PW-101	11/28/2011 12:00 AM	0.75 - 1 ft		
PW	D	PW-OffProject_RedMapleSwamp	PW-102	11/28/2011 12:00 AM	0.75 - 1 ft		
PW	D	PW-OffProject_RedMapleSwamp	PW-103	11/28/2011 12:00 AM	0.75 - 1 ft		
PW	D	PW-OffProject_RedMapleSwamp	PW-104	11/28/2011 12:00 AM	0.75 - 1 ft		
PW	D	PW-OffProject_RedMapleSwamp	PW-105	11/28/2011 12:00 AM	0.75 - 1 ft		
PW	D	PW-OffProject_RedMapleSwamp	PW-1-2014	7/30/2014 12:00 AM	2.7 - 3 ft		
PW	D	PW-OffProject_RedMapleSwamp	PW-2-2014	7/30/2014 12:00 AM	2.7 - 3 ft		
PW	D	PW-OffProject_RedMapleSwamp	PW-3-2014	7/30/2014 12:00 AM	2.7 - 3 ft		
PW	D	PW-OffProject_RedMapleSwamp	PW-4-2014	7/29/2014 12:00 AM	2.7 - 3 ft		
PW	D	PW-OffProject_RedMapleSwamp	PW-5-2014	7/29/2014 12:00 AM	2.7 - 3 ft		
PW	T	PW-OffProject_RedMapleSwamp	PW-1	10/29/2008 12:00 AM	0.75 - 1 ft	1	0
PW	T	PW-OffProject_RedMapleSwamp	PW-101	11/28/2011 12:00 AM	0.75 - 1 ft	1	0
PW	T	PW-OffProject_RedMapleSwamp	PW-102	11/28/2011 12:00 AM	0.75 - 1 ft	1	0
PW	T	PW-OffProject_RedMapleSwamp	PW-103	11/28/2011 12:00 AM	0.75 - 1 ft	1	0
PW	T	PW-OffProject_RedMapleSwamp	PW-104	11/28/2011 12:00 AM	0.75 - 1 ft	1	0
PW	T	PW-OffProject_RedMapleSwamp	PW-105	11/28/2011 12:00 AM	0.75 - 1 ft	1	0
PW	T	PW-OffProject_RedMapleSwamp	PW-1-2014	7/30/2014 12:00 AM	2.7 - 3 ft	0.6	1
PW	T	PW-OffProject_RedMapleSwamp	PW-1-2014	7/30/2014 12:00 AM	2.7 - 3 ft	0.25	0
PW	T	PW-OffProject_RedMapleSwamp	PW-2-2014	7/30/2014 12:00 AM	2.7 - 3 ft	1.1	1
PW	T	PW-OffProject_RedMapleSwamp	PW-2-2014	7/30/2014 12:00 AM	2.7 - 3 ft	0.25	0
PW	T	PW-OffProject_RedMapleSwamp	PW-3-2014	7/30/2014 12:00 AM	2.7 - 3 ft	0.6	1
PW	T	PW-OffProject_RedMapleSwamp	PW-3-2014	7/30/2014 12:00 AM	2.7 - 3 ft	0.25	0
PW	T	PW-OffProject_RedMapleSwamp	PW-4-2014	7/29/2014 12:00 AM	2.7 - 3 ft	0.4	1
PW	T	PW-OffProject_RedMapleSwamp	PW-4-2014	7/29/2014 12:00 AM	2.7 - 3 ft	0.94	1
PW	T	PW-OffProject_RedMapleSwamp	PW-5-2014	7/29/2014 12:00 AM	2.7 - 3 ft	0.2	1
PW	T	PW-OffProject_RedMapleSwamp	PW-5-2014	7/29/2014 12:00 AM	2.7 - 3 ft	0.25	0
PW	T	PW-OffProject_RedMapleSwamp	PW-C	8/4/2014 12:00 AM	2.7 - 3 ft	0.25	0
PW	T	PW-OffProject_RedMapleSwamp	PW-E	8/4/2014 12:00 AM	2.7 - 3 ft	0.25	0
PW	T	PW-OffProject_RedMapleSwamp	PW-F	8/4/2014 12:00 AM	2.7 - 3 ft	0.25	0
PW	T	PW-OffProject_RedMapleSwamp	PW-H	8/1/2014 12:00 AM	2.7 - 3 ft	0.25	0
PW	T	PW-OffProject_RedMapleSwamp	PW-I	8/1/2014 12:00 AM	2.7 - 3 ft	0.25	0
PW	T	PW-OffProject_RedMapleSwamp	PW-TS1A	8/4/2014 12:00 AM	2.7 - 3 ft	0.25	0
PW	T	PW-OffProject_RedMapleSwamp	PW-TS1C	8/4/2014 12:00 AM	2.7 - 3 ft	0.25	0

Off-Project Red Maple Swamp/Tidal Stream Area Porewater

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.110/9/2020 3:56:18 PM
From File	PW input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_PW_Metals|Barium_Diss|ug/l

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	8.3	Mean	19.26
Maximum	67.9	Median	15.6
SD	17.6	Std. Error of Mean	5.566
Coefficient of Variation	0.914	Skewness	2.829

Normal GOF Test

Shapiro Wilk Test Statistic	0.584	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.406	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	29.46	95% Adjusted-CLT UCL (Chen-1995)	33.74
		95% Modified-t UCL (Johnson-1978)	30.29

Gamma GOF Test

A-D Test Statistic	1.032	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.734	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.324	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.269	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	2.483	k star (bias corrected MLE)	1.805
Theta hat (MLE)	7.756	Theta star (bias corrected MLE)	10.67
nu hat (MLE)	49.67	nu star (bias corrected)	36.1
MLE Mean (bias corrected)	19.26	MLE Sd (bias corrected)	14.34
		Approximate Chi Square Value (0.05)	23.35
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	21.58

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	29.78	95% Adjusted Gamma UCL (use when n<50)	32.22

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.822	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.27	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	2.116	Mean of logged Data	2.743
Maximum of Logged Data	4.218	SD of logged Data	0.608

Assuming Lognormal Distribution

95% H-UCL	30.28	90% Chebyshev (MVUE) UCL	29.13
95% Chebyshev (MVUE) UCL	34.03	97.5% Chebyshev (MVUE) UCL	40.83
99% Chebyshev (MVUE) UCL	54.19		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Off-Project Red Maple Swamp/Tidal Stream Area Porewater

Nonparametric Distribution Free UCLs			
95% CLT UCL	28.42	95% Jackknife UCL	29.46
95% Standard Bootstrap UCL	27.77	95% Bootstrap-t UCL	47.54
95% Hall's Bootstrap UCL	64.39	95% Percentile Bootstrap UCL	30.06
95% BCA Bootstrap UCL	34.62		
90% Chebyshev(Mean, Sd) UCL	35.96	95% Chebyshev(Mean, Sd) UCL	43.52
97.5% Chebyshev(Mean, Sd) UCL	54.02	99% Chebyshev(Mean, Sd) UCL	74.64

Suggested UCL to Use	
95% Chebyshev (Mean, Sd) UCL	43.52

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.110/9/2020 4:09:26 PM
From File	PW input_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

RA_PW_Metals|Barium_Total|ug/l

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
		Number of Missing Observations	5
Minimum	8.4	Mean	19.22
Maximum	67	Median	15.7
SD	17.3	Std. Error of Mean	5.472
Coefficient of Variation	0.9	Skewness	2.82

Normal GOF Test

Shapiro Wilk Test Statistic	0.584	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.412	Lilliefors GOF Test
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	29.25	95% Adjusted-CLT UCL (Chen-1995)	33.43
		95% Modified-t UCL (Johnson-1978)	30.06

Gamma GOF Test

A-D Test Statistic	1.043	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.734	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.333	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.269	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.54	k star (bias corrected MLE)	1.845
Theta hat (MLE)	7.567	Theta star (bias corrected MLE)	10.42
nu hat (MLE)	50.8	nu star (bias corrected)	36.89
MLE Mean (bias corrected)	19.22	MLE Sd (bias corrected)	14.15
		Approximate Chi Square Value (0.05)	23.99
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	22.2

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	29.56	95% Adjusted Gamma UCL (use when n<50)	31.95

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.819	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.281	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.262	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.128	Mean of logged Data	2.746
Maximum of Logged Data	4.205	SD of logged Data	0.602

Assuming Lognormal Distribution

95% H-UCL	30.04	90% Chebyshev (MVUE) UCL	29
95% Chebyshev (MVUE) UCL	33.85	97.5% Chebyshev (MVUE) UCL	40.57
99% Chebyshev (MVUE) UCL	53.79		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Off-Project Red Maple Swamp/Tidal Stream Area Porewater

Nonparametric Distribution Free UCLs			
95% CLT UCL	28.22	95% Jackknife UCL	29.25
95% Standard Bootstrap UCL	27.69	95% Bootstrap-t UCL	46.79
95% Hall's Bootstrap UCL	63.25	95% Percentile Bootstrap UCL	29.31
95% BCA Bootstrap UCL	34.58		
90% Chebyshev(Mean, Sd) UCL	35.64	95% Chebyshev(Mean, Sd) UCL	43.07
97.5% Chebyshev(Mean, Sd) UCL	53.39	99% Chebyshev(Mean, Sd) UCL	73.67

Suggested UCL to Use	
95% Chebyshev (Mean, Sd) UCL	43.07

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

RA_PW_VOCs|Carbon Disulfide_Total|ug/l

General Statistics

Total Number of Observations	23	Number of Distinct Observations	7
Number of Detects	6	Number of Non-Detects	17
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	0.2	Minimum Non-Detect	0.25
Maximum Detect	1.1	Maximum Non-Detect	1
Variance Detects	0.111	Percent Non-Detects	73.91%
Mean Detects	0.64	SD Detects	0.333
Median Detects	0.6	CV Detects	0.521
Skewness Detects	0.204	Kurtosis Detects	-0.947
Mean of Logged Detects	-0.586	SD of Logged Detects	0.618

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.959	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.214	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.343	KM Standard Error of Mean	0.0666
KM SD	0.263	95% KM (BCA) UCL	0.497
95% KM (t) UCL	0.458	95% KM (Percentile Bootstrap) UCL	0.463
95% KM (z) UCL	0.453	95% KM Bootstrap t UCL	0.455
90% KM Chebyshev UCL	0.543	95% KM Chebyshev UCL	0.634
97.5% KM Chebyshev UCL	0.759	99% KM Chebyshev UCL	1.006

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.246	Anderson-Darling GOF Test	
5% A-D Critical Value	0.7	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.187	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.334	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.746	k star (bias corrected MLE)	1.984
Theta hat (MLE)	0.171	Theta star (bias corrected MLE)	0.323
nu hat (MLE)	44.95	nu star (bias corrected)	23.81
Mean (detects)	0.64		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.32
Maximum	1.1	Median	0.248
SD	0.29	CV	0.906
k hat (MLE)	0.954	k star (bias corrected MLE)	0.859
Theta hat (MLE)	0.335	Theta star (bias corrected MLE)	0.373
nu hat (MLE)	43.88	nu star (bias corrected)	39.49
Adjusted Level of Significance (β)	0.0389		
Approximate Chi Square Value (39.49, α)	26.1	Adjusted Chi Square Value (39.49, β)	25.31
95% Gamma Approximate UCL (use when n>=50)	0.484	95% Gamma Adjusted UCL (use when n<50)	0.499

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.343	SD (KM)	0.263
Variance (KM)	0.069	SE of Mean (KM)	0.0666
k hat (KM)	1.707	k star (KM)	1.513
nu hat (KM)	78.52	nu star (KM)	69.61
theta hat (KM)	0.201	theta star (KM)	0.227
80% gamma percentile (KM)	0.53	90% gamma percentile (KM)	0.714
95% gamma percentile (KM)	0.891	99% gamma percentile (KM)	1.292

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (69.61, α)	51.41	Adjusted Chi Square Value (69.61, β)	50.27
95% Gamma Approximate KM-UCL (use when n>=50)	0.465	95% Gamma Adjusted KM-UCL (use when n<50)	0.475

Off-Project Red Maple Swamp/Tidal Stream Area Porewater

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.936	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.215	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.345	Mean in Log Scale	-1.292
SD in Original Scale	0.26	SD in Log Scale	0.674
95% t UCL (assumes normality of ROS data)	0.438	95% Percentile Bootstrap UCL	0.439
95% BCA Bootstrap UCL	0.456	95% Bootstrap t UCL	0.471
95% H-UCL (Log ROS)	0.469		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.27	KM Geo Mean	0.281
KM SD (logged)	0.572	95% Critical H Value (KM-Log)	2.038
KM Standard Error of Mean (logged)	0.148	95% H-UCL (KM -Log)	0.424
KM SD (logged)	0.572	95% Critical H Value (KM-Log)	2.038
KM Standard Error of Mean (logged)	0.148		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.357	Mean in Log Scale	-1.328
SD in Original Scale	0.282	SD in Log Scale	0.793
95% t UCL (Assumes normality)	0.458	95% H-Stat UCL	0.533

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.458

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Attachment C

Calculation of the SU-Specific 95% UCL and Weighted Mean UCL Concentrations (ISM Calculator)

ATTACHMENT C, TABLE C-1
INCREMENTAL SAMPLING METHODOLOGY CALCULATOR - TOTAL PCB AROCLORS IN ON-PROJECT BLUE BEACH SOIL
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ISM Calculator for 1-sided Upper Confidence Limit (UCL) for the Mean

Note on Selecting a UCL Method. This worksheet can be used to calculate a 95UCL from ISM data using both the Chebyshev and Student's-t methods. If you have discrete data or other knowledge that indicates the variability in contaminant concentrations within the DU is low, use the Student's t method. If discrete data or other knowledge suggests that the variability may be high or the variability is unknown, use the Chebyshev method. Because the Chebyshev method tends to yield higher UCL values for the same data set, it's statistical performance is desirable - it achieves the desired 95% coverage of the mean under conditions when the variability of concentrations throughout the DU are moderate or high (See Table 4-4). One drawback of this performance is that the Chebyshev will tend to more severely overestimate the true mean than Student's t. Nevertheless, if no discrete data are available to estimate this variability, then Chebyshev is generally preferred over Student's t. Do not mistake the standard deviation (SD) of replicates as a measure of this variability. The SD of replicates is a measure of consistency in estimates of the mean - this is considered a reliable indicator of the laboratory processing steps, but not an indicator of the degree of variability in the distribution of concentrations throughout the DU.

	Replicate Results Per Sampling Unit (mg/kg)						
	ISM-BG1		ISM-BG5		ISM-UPS		
Replicate Number	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	0 - 1 ft	1 - 3 ft	Notes
1	0.41	0.38	0.12	0.079	0.25	0.097	If you have replicate ISM results, enter data in the first section "Replicate Results"
2	0.22	0.42	0.17	0.077	0.27	0.11	If you have summary statistics, enter data in the second section "Summary Statistics"
3	0.32	0.26	0.20	0.061	0.19	0.072	
arithmetic mean	0.32	0.35	0.16	0.072	0.24	0.093	sample mean of replicate results
standard deviation	0.095	0.083	0.040	0.010	0.042	0.019	sample standard deviation of replicate results
CV = SD / mean	0.30	0.24	0.25	0.14	0.18	0.21	CV gives a measure of spread of the replicates, which is different from CV of underlying distribution
count (r)	3	3	3	3	3	3	For ISM, the sample size in the UCL calculation is the number of replicates, not the number of increments.
alpha (95% = 0.05)	0.05	0.05	0.05	0.05	0.05	0.05	standard choice is alpha = 0.05
t(alpha, df=r-1)	2.92	2.92	2.92	2.92	2.92	2.92	from Student's t distribution
Student's t UCL	0.48	0.49	0.23	0.089	0.31	0.13	Note that the UCL for these relatively small sample sizes will typically exceed the maximum.
Chebychev UCL	0.56	0.56	0.27	0.10	0.34	0.14	The calculated UCL should be used (do not use the maximum).
Selected UCL (a)	0.48	0.49	0.23	0.089	0.31	0.13	If the CV > 35% (indicating high variability), the Chebychev UCL is selected, if the CV < 35% (indicating low variability), the Student's t UCL is selected.

Notes:
All results are presented in milligram per kilogram (mg/kg).
% = percent.
CV = coefficient of variation.
df = degrees of freedon.
ft = feet.
ISM = incremental sampling methodology.
ITRC = Interstate Technical Regulatory Council.
r = count.
RSD = relative standard deviation.
SD = standard deviation.
UCL = upper confidence limit.

ATTACHMENT C, TABLE C-2
WEIGHTED MEAN UPPER CONFIDENCE LIMIT CONCENTRATION CALCULATION -
TOTAL PCB AROCLORS IN ON-PROJECT BLUE BEACH SOIL
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	Surface Area (square ft)	Fraction of On-Project Blue Beach Area (a)	SU-Specific UCL (b) (mg/kg)		Weighted Mean UCL Concentration (c) (mg/kg)	
			(0 - 1 ft)	(1 - 3 ft)	(0 - 1 ft)	(1 - 3 ft)
SU-Specific:						
ISM-BG1	1,117	0.0080	0.48	0.49	--	--
ISM-BG5	1,124	0.0081	0.23	0.089	--	--
ISM-UPS	137,016	0.98	0.31	0.13	--	--
On-Project Blue Beach Area:	139,257	--	--	--	0.31	0.13

Notes:
All results are presented in milligram per kilogram (mg/kg).
SU = sampling unit.
ft = feet.
ISM = incremental sampling methodology.
ITRC = Interstate Technical Regulatory Council.
UCL = upper confidence limit.
(a) Equals the SU-specific surface area / total surface area of the on-Project Blue Beach area.
(b) Calculated per soil depth interval using the ITRC ISM Calculator.
(c) Calculated per soil depth interval; Equals the sum of the SU-specific UCLs weighted based on their size (i.e., fraction of on-Project Blue Beach Area).

Attachment D

Background Evaluation

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Attachment D
Background Evaluation

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Attachments

Attachment D-1 ProUCL Input/Output

Attachment D-2 Geochemical Analysis

Acronyms

bgs	below ground surface
BTV	background threshold value
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	chemical of potential concern
ERA	ecological risk assessment
ft	feet
FS	Feasibility Study
FUDS	formerly used defense site
HMW	High Molecular Weight
HHRA	human health risk assessment
LMW	Low Molecular Weight
LOD	level of detection
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
QAPP	quality assurance project plan
RAWP	risk assessment work plan
RI	remedial investigation
USACE	United States Army Corp of Engineers
USEPA	United States Environmental Protection Agency

1. Introduction

An evaluation of representative soil, hydric soil, and sediment background chemistry data was conducted in support of the Remedial Investigation/Feasibility Study (RI/FS) for the Former Blue Beach Disposal Area Formerly Used Defense Site (FUDS) in North Kingstown, Rhode Island (the Project). The purpose of the background evaluation was to distinguish Site-related conditions from conditions that are naturally occurring or due to anthropogenic influences that are not Site-related. The background evaluation focused on constituents of potential concern (COPCs) that were identified in the baseline human health risk assessment (HHRA) and ecological risk assessment (ERA).

The background evaluation was performed in accordance with the methodologies detailed in the Updated Risk Assessment Work Plan (RAWP) provided as Appendix E of the Quality Assurance Project Plan (QAPP) (Mabbett, 2018). These methods are in accordance with the United States Environmental Protection Agency (USEPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and United States Army Corp of Engineers (USACE) risk assessment guidance specific to the evaluation of background media, as available/applicable.

Representative soil, hydric soil, and sediment background chemistry data were collected for comparison to Site-specific data in the risk assessment. The relevant available background data were compiled and compared with Site-specific data to distinguish Site-related impacts from non-Site-related background conditions (naturally occurring or anthropogenic). The background evaluation was conducted as a tiered process in conjunction with the risk assessment to determine which COPCs identified by the HHRA and ERA are Site-related, in accordance with the Tri-Service Position Paper on Background Levels in Risk Assessment (USACE, 2011).

1.1 Report Organization

This background evaluation attachment is organized into the following sections:

- Section 1.0: Introduction
- Section 2.0: Data Used in Background Evaluation – A description of the data included in the background evaluation, which includes data collected in background areas and Site-specific data collected in the On-Project and Off-Project areas.
- Section 3.0: Background Evaluation Methodology – The methods used to evaluate the presence of outliers, calculate background threshold values, compare Site and background data with two-sample hypothesis tests, and conduct the geochemical analysis.
- Section 4.0: Background Evaluation Results – The results of the background evaluation are presented for each exposure media and by exposure area.
- Section 5.0: Summary and Conclusions – A summary of results and conclusions of the background evaluation.

2. Background Data

This section presents the background data collected at background sampling locations and the Site data that are included in the background evaluation. Also, the process of COPC selection for inclusion in the background evaluation is presented.

2.1 Background Sampling Locations

The environmental data evaluated in the risk assessment, which includes both Site and background data, is described in Section 2 of the Risk Assessment and presented in Attachment A. The available Site data selected for evaluation in the risk assessment were grouped into one of the following exposure areas:

- On-Project Blue Beach area – within the Former Blue Beach Disposal Area FUDS (e.g., within the jurisdictional Blue Beach FUDS boundary)
- Off-Project Red Maple Swamp / tidal stream area – within the tidal marsh referred to as “Red Maple Swamp” and the adjacent public walking path from Circuit Drive to Blue Beach
- Off-Project Narragansett Bay and Beachfront area – within the Narragansett Bay and beachfront

Representative background soil, hydric soil, and sediment were collected in May 2020 at Rome Point State Park in North Kingstown, Rhode Island, and in the upstream portion of the Off-Project Red Maple Swamp / tidal stream area (Figure 2-X of risk assessment). Both areas are deviations from background sampling locations identified in the RAWP, as described in the *Draft Trip Report for the Comprehensive Remedial Investigation Former Blue Beach Disposal Area FUDs* (“Trip Report”; Mabbett, 2020), because permission was not granted for access to previously identified background areas. Rome Point State Park is located on Narragansett Bay with similar shoreline features to the former Blue Beach Disposal Area but has not been impacted by past military operations. The portion of the tidal stream where the background sediment samples were collected is upgradient and outside of the Site-related influence.

Background soil samples were collected at twenty locations and the data were divided into two different depth intervals for evaluation, consistent with Site soil samples. Background surface soil is defined as the soil collected at a depth within 0 to 1 foot (ft) below ground surface (bgs). Background subsurface soil was collected at a depth interval of 1 to 3 ft bgs.

Background hydric soil samples were collected at ten sample locations within a coastal wetland area in Rome Point State Park. Consistent with Site hydric soil samples, background hydric soil samples were collected in two depth intervals: surface samples were collected at a depth within 0 to 1 ft bgs and subsurface samples were collected at a depth within 1 to 2 ft bgs.

Background sediment samples were collected in two areas. Ten sediment samples were collected at a depth of 0 to 1 ft bgs in the intertidal zone along the shoreline of the beach at Rome Point State Park for comparison with the Off-Project Narragansett Bay and Beachfront Area. Five sediment samples were collected at a depth of 0 to 0.5 ft bgs at five locations in the upstream portion of the tidal stream between Circuit Drive/Outfall 025 and Outfall 026 for comparison with the Off-Project Red Maple Swamp / tidal stream area. The latter five sediment samples were collected concurrently with the Off-Project Red Maple Swamp / tidal stream area Site samples (SED-331, SED-333, SED-335, SED-337, and SED-339) and were submitted with these Site samples for the analyses of sediment quality including sediment chemistry, bioassays, and macroinvertebrate community. The sediment quality evaluation is presented in the ERA.

2.2 Data Treatment

Background and Site data were validated and qualified prior to use in the risk assessment and the background evaluation as described in Section 2 of the risk assessment. Summary statistics, treatment of duplicate samples, and the calculation of totals for polycyclic aromatic hydrocarbon (PAHs), polychlorinated biphenyl (PCB) Aroclors, and xylenes of background data were conducted consistent with Site data.

2.3 COPC Selection

Preliminary COPCs were identified for inclusion in the background evaluation based on the initial screening of Site data in the HHRA and ERA. The list of COPCs for each exposure media and exposure area, for which relevant background data are available, are presented below.

Preliminary COPCs Identified for the Background Evaluation

Exposure Media	Exposure Area	Preliminary COPCs			
Surface Soil	On-Project Blue Beach Area	**Inorganics**		**Organics**	
		Aluminum	Lead	Anthracene	
		Antimony	Manganese	Benzo(a)Pyrene	
		Arsenic	Mercury	Dibenzo(a,h)Anthracene	
		Cadmium	Nickel	Total High Molecular Weight (HMW) PAHs	
		Chromium	Silver	Total PAHs	
		Cobalt	Thallium		
		Copper	Vanadium		
		Iron	Zinc		
	Off-Project Red Maple Swamp / Tidal Marsh Area	**Inorganics**		**Organics**	
		Aluminum	Manganese	Anthracene	Dibenzo(a,h)Anthracene
		Arsenic	Mercury	Benzo(a)Anthracene	Indeno(1,2,3-cd)Pyrene
		Chromium	Thallium	Benzo(a)Pyrene	Pyrene
		Cobalt	Vanadium	Benzo(b)Fluoranthene	Total HMW PAHs
		Iron	Zinc	Benzo(g,h,i)Perylene	Total PAHs
		Lead		Chrysene	
Subsurface Soil	On-Project Blue Beach Area	**Inorganics**		**Organics**	
		Aluminum	Copper	Benzo(a)Pyrene	
		Antimony	Iron		
		Arsenic	Lead		
		Cadmium	Manganese		
		Cobalt	Thallium		
	Off-Project Red Maple Swamp / Tidal Marsh Area	**Inorganics**		**Organics**	
		Arsenic		Benzo(a)Pyrene	Naphthalene
Sediment	Off-Project Red Maple Swamp / Tidal Marsh Area	**Inorganics**		**Organics**	
		Aluminum	Lead	Total PCB Aroclors	Fluorene
		Arsenic	Manganese	1-Methylnaphthalene	Indeno(1,2,3-cd)Pyrene
		Barium	Mercury	2-Methylnaphthalene	Naphthalene
		Beryllium	Nickel	Acenaphthene	Phenanthrene
		Cadmium	Selenium	Acenaphthylene	Pyrene
		Chromium	Silver	Anthracene	Total HMW PAHs
		Cobalt	Thallium	Benzo(a)Anthracene	Total Low Molecular Weight (LMW) PAHs
		Copper	Vanadium	Benzo(a)Pyrene	
		Iron	Zinc	Benzo(b)Fluoranthene	Total PAHs
				Benzo(g,h,i)Perylene	Bis-(2-Ethylhexyl)-Phthalate
				Benzo(k)Fluoranthene	Carbazole
				Chrysene	2-Butanone (MEK)
				Dibenzo(a,h)Anthracene	Acetone
				Fluoranthene	Carbon Disulfide
	Off-Project Narragansett Bay and Beachfront Area	**Inorganics**			
		Aluminum	Iron		
		Arsenic	Manganese		
		Cobalt	Thallium		
Hydric Surface Soil	Off-Project Red Maple Swamp / Tidal Marsh Area	**Inorganics**		**Organics**	
		Aluminum	Lead	Total PCB Aroclors	Benzo(k)Fluoranthene
		Antimony	Manganese	1-Methylnaphthalene	Chrysene
		Arsenic	Mercury	2-Methylnaphthalene	Dibenzo(a,h)Anthracene
		Chromium	Selenium	Anthracene	Indeno(1,2,3-cd)Pyrene
		Cobalt	Thallium	Benzo(a)Anthracene	Naphthalene
		Copper	Vanadium	Benzo(a)Pyrene	Pyrene
		Iron	Zinc	Benzo(b)Fluoranthene	Total HMW PAHs
				Benzo(g,h,i)Perylene	Total PAHs
Hydric Subsurface Soil	Off-Project Red Maple Swamp / Tidal Marsh Area	**Inorganics**		**Organics**	
		Aluminum	Iron	Total PCB Aroclors	
		Arsenic	Thallium		
		Cobalt	Vanadium		

3. Background Evaluation Methods

As described in the RAWP, the background evaluation consisted of a tiered process that includes evaluation of the background datasets for potential outliers, derivation of background threshold values (BTVs), hypothesis testing to compare the mean background concentration with Site-related concentrations, and geochemical analysis each COPC. This section presents the methodologies used to identify the presence of outliers, calculate BTVs, conduct the two-sample hypothesis tests between Site and background, and conduct the geochemical analysis. The results of each evaluation are presented in Section 4 for each exposure media and area. The statistical test output for the calculation of BTVs and the two-sample hypothesis tests is presented in Attachment D-1. The geochemical analysis output is presented in Attachment D-2.

3.1 Outlier Determination

Per the RAWP, the background datasets were evaluated for the presence of outliers using the default outlier tests (Dixon's Test) in USEPA's ProUCL software (Version 5.1, USEPA, 2015, 2016). These statistical tests can identify "extreme" values in the background datasets; however, extreme values were not identified as outliers unless additional justification was evident. This approach for determining if elevated values should be removed from the background dataset is consistent with the USACE Tri-Service Paper on Background (USACE, 2011), which cites both the USEPA CERCLA guidance on background (USEPA, 2002) and US Navy guidance on background (NAVFAC, 1999). The US Navy 1999 guidance is specific on this topic:

> "If the [outlier] test indicates the suspect value(s) are indeed larger than expected, relative to the remaining data, the outliers should be examined to determine if they are mistakes or errors. If they are, they should be removed from the data set. Otherwise, they should not be removed, even though the statistical test indicated they were outliers."

In order to determine whether any of the background samples identified as extreme values had evidence of errors, the "Deviations from the QAPP/FSP" and "Data Validation" sections of the Trip Report were reviewed for information on any quality control failures for the laboratory analysis or field collection effort errors that would have affected background samples. No such errors were reported for any of the background samples included in this evaluation. Therefore, no background samples identified as extreme values were excluded on the basis of field collection or laboratory analysis errors.

Datasets with background samples identified as extreme values were further evaluated by conducting outlier tests with data transformations. The ProUCL outlier tests are parametric tests and as such, the tested dataset is assumed to be normal following the removal of the outlier(s). Because environmental datasets are often not normally distributed, these parametric tests can erroneously identify elevated values as outliers. To further examine this possibility, data transformations including a natural log transformation and a gamma correction (x^(1/3)) were applied to the datasets for which extreme values were identified and the default outlier tests were performed again. If the extreme values were not identified by the outlier test based on the transformed datasets, then it is likely that the values were identified in error (based on the non-transformed dataset tests) because the datasets are not normally distributed. In these cases, the values were not removed from the datasets.

If, however, the values were identified as extreme values based on outlier test results of both the non-transformed dataset and one of the transformed datasets (i.e., lognormal or gamma), the values were further examined to determine if the same sample was identified as an extreme value for other COPCs in the same chemical group (e.g., metals, PAHs). If a sample was identified as an extreme value and the same sample was identified for other COPCs in the same chemical group, the value was removed from the dataset prior to the BTV calculation, the two-sample hypothesis test, and the geochemical analysis.

3.2 Background Threshold Values

BTV statistics were calculated in ProUCL Version 5.1 (USEPA, 2015, 2016) for preliminary COPCs identified in the HHRA and ERA with at least five detected concentrations available. As detailed in Section 3.1, values determined to be outliers were removed from the dataset prior to the calculation of BTVs.

The 95% upper tolerance limit (95UTL), which is calculated such that 95% of observations from the background dataset are less than or equal to the statistic (which is the 95% upper confidence limit of the 95th percentile of the dataset) with 95% confidence, was selected as the BTV statistic. The 95UTL statistic selected was based on the distribution of the detected concentrations of each dataset (i.e., if the detected concentrations followed a normal, lognormal, or gamma distribution, then the normal, lognormal, or gamma 95UTL was selected, respectively), or in cases of no discernible distribution, the nonparametric 95UTL statistic was selected. If the dataset included non-detects, the Kaplan-Meier BTV statistics were selected based on the distribution of the detected concentrations. The BTV statistics output from ProUCL is presented in Attachment D-1.

3.3 Two-Sample Hypothesis Tests

For COPCs for which Site concentrations exceed the BTVs (as presented in the risk assessment), two-sample hypothesis tests were conducted when a minimum of five samples with four detected concentrations were available in both the Site and background datasets. The two-sample hypothesis test compares the central tendency (i.e., the mean or median) of COPC concentrations measured in Site samples (i.e., the Site population) with the central tendency of COPC concentrations measured in background (i.e., the background population). These tests provide information on whether the COPCs concentrations in the Site and background populations are consistent.

The two-sample hypothesis tests were conducted with the following steps. First, the distributions of COPC concentrations detected in the Site and background datasets were tested for normality using the Shapiro-Wilk test (significance level of 0.05). Next, a two-sample test was selected depending upon the distribution and the presence/absence of non-detect values in each dataset. For the purposes of the two-sample hypothesis tests non-detects were included at the limit of detection (LOD). When both the Site and the background datasets were normally distributed with no non-detect values, a parametric test (t-test) was conducted. When the Site and/or the background datasets were not normally distributed, a non-parametric test was selected as follows: the Wilcoxon test was selected when no more than one LOD was present in either dataset and the Tarone-Ware test was selected when one or both datasets had more than one LOD value present. All two-sample hypothesis tests were conducted on non-transformed data.

The two-sample comparison tests assume that the Site concentrations arise from the same distribution as the background concentrations. The null and alternative hypotheses are defined as:

> *Ho* (null): The Site mean/median concentration is less than or equal to the mean/median concentration in the background areas ($p > 0.05$: fail to reject Ho)
>
> *Ha* (alternative): The Site mean/median concentration is greater than the mean/median concentration in the background area ($p < 0.05$: reject Ho)

For all tests (t-test, Wilcoxon, or Tarone-Ware), Site concentrations were determined to be less than or equal to background concentrations at a significance level of 0.05 and the COPC was not retained for the risk assessment. If null hypothesis was rejected, and the alternative hypothesis (i.e., Site concentrations are higher than background concentrations) was accepted, the COPC was retained in the risk assessment.

The two-sample hypothesis test output is presented in Attachment D-1. For media/chemicals for which requirements for conducting a statistical evaluation are not met (e.g., Site or background dataset consist of mainly non-detects), a qualitative/graphical comparison (using box plots) will be performed.

3.4 Geochemical Analysis

For metal COPCs for which the two-sample hypothesis tests (Section 3.3) concluded Site concentrations were greater than background, a geochemical analysis was conducted. The methodology used in the geochemical analysis is based on processes that transport and redistribute naturally-occurring chemicals, particularly metals, in the geologic environment (Battelle Memorial Institute et al., 2002). During soil formation, primary minerals weather (break down) and secondary minerals form. The secondary minerals have large surface areas (on a microscopic basis), and therefore can be highly adsorptive. Constituents can also incorporate within secondary minerals. In addition to silica, the three main components of the secondary minerals are aluminum, iron, and manganese. These constituents occur as oxide, hydroxide, and oxyhydroxide minerals and as aluminum in clays. A strong correlation between one of these

three constituents (“reference elements”) and trace constituents (COPCs such as arsenic or copper) is an indicator that the trace metal is present due to natural soil forming processes.

Correlations between the reference elements and COPCs were examined using scatterplots and pairwise correlations. Scatterplots of metal COPCs plotted against aluminum, iron, and manganese are included in Attachment D-2. On the scatterplots a red hollow triangle was used to indicate a background data point and a black hollow circle was used to indicate a Site data point. The x-axis and y-axis on the scatterplots are shown in logarithmic (base 10) scale due to the large range of concentration values observed for most metals (one or more orders of magnitude).

The scatterplots were examined to determine whether the background data points lined up on a trend line from the lower-left corner to the upper-right corner on the scatterplot, which would be expected if a positive geochemical correlation exists between the two given metals in background. If the background data points formed a positive trend line and the Site data points generally followed this trend line, then the strength of the correlation was investigated further with pairwise correlation, as discussed below. If, however, the background data points were scattered throughout the plots with no clear pattern, then no positive geochemical correlation exists between the two given metals in background and the metal was retained as a COPC.

The pairwise correlation between two metals was assessed using the Kendall’s tau (τ) correlation coefficient (Kendall 1938, 1975). The Kendall’s tau correlation coefficient was selected as the method to assess the strength of correlations because tau is a non-parametric, rank-based statistical method that is not sensitive to the effect of a small number of unusual values, such as outliers, and is suitable for variables that exhibit skewness around the general relationship or for a range of values that spans several orders of magnitude (Helsel and Hirsch 2002). The Kendall’s tau correlations were computed using Stata version IC/11.0, developed by StataCorp LP (StataCorp LP 2009), and the resulting correlation coefficients are shown under each pairwise scatterplot in Attachment D-2. A two-sided hypothesis test for correlation was also performed to test for the significance of tau, and the associated p-values are also presented in Attachment D-2 for reference.

The Kendall’s tau correlation coefficient and associated p-value were used to determine the correlation strength between two given metals. A qualitative classification of correlation strength based on tau is presented in the USACE Environmental Statistics guidance (USACE 2013) and summarized below**.** Based on the qualitative classification, a Kendall’s tau correlation coefficient of at least 0.5 with an associated p-value of less than 0.05 was required to indicate a moderate correlation. If a moderate correlation was present between a COPC and at least one of the reference elements, then it was concluded that the COPC is naturally occurring and eliminated from the HHRA and ERA.

Qualitative Classification of Correlation Strength for Kendall’s Tau

Absolute value of correlation coefficient (Kendall’s tau)	Degree of relationship
$\tau < 0.30$	Extremely Weak
$0.30 < \tau < 0.50$	Weak
$0.50 < \tau < 0.75$	Moderate
$0.75 < \tau < 0.90$	Moderately Strong
$0.90 < \tau < 0.95$	Strong
$0.95 < \tau < 1.00$	Very Strong

4. Results

This section presents the results of the background evaluation including the identification of outliers, the calculation of BTVs, the two-sample hypothesis tests between Site and background, and the geochemical analyses. The results are reported separately for each background medium and area.

4.1 Background Surface Soil

4.1.1 Outlier Determination – Surface Soil

The results of the outlier tests identified extreme upper-tail values for antimony, arsenic, mercury (a lower-tail value [i.e., minimum] was also identified), nine individual PAH compounds, total HMW PAHs, and total PAHs (Table 1). Based on review of the Trip Report, no errors were reported for the samples for which extreme values were identified. The extreme values for the listed COPCs were further evaluated by transforming the COPC datasets using natural log transformation and gamma correction and performing the outlier tests again on the transformed datasets.

- The extreme values identified for arsenic and mercury were not outliers based on the tests performed with the transformed datasets, which suggests that the not normal distribution of the datasets are influencing the outlier test outcome and the values identified are not true outliers for those datasets. Therefore, the values were not removed as outliers for arsenic and mercury.
- The extreme value for antimony was also identified as an outlier based on the transformed datasets, but no outlier values were identified for other metal COPCs for this sample (SB-406), with the exception of arsenic which is discussed above, and therefore, the value was not removed as an outlier for antimony.
- The extreme values identified for individual and total PAHs was identified for the same sample (SB-412). The extreme value was identified as an extreme value based on one or both of the outlier test results of the transformed datasets for anthracene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, pyrene, total HMW PAHs, and total PAHs. Therefore, the values for these COPCs were removed from the dataset.
- For the remaining PAHs, the extreme value was not identified based on both outlier test results of the transformed datasets for benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, and indeno(1,2,3-cd)pyrene, which suggests that the distribution of the datasets are influencing the outlier test outcome and the values identified are not true outliers for these datasets. Therefore, the values were not removed as outliers from these datasets.

Therefore, the outlier values were determined for anthracene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, pyrene, total HMW PAHs, and total PAHs and these values were removed from the datasets prior to BTV calculation, two-sample hypothesis test, and the geochemical analysis.

4.1.2 Background Threshold Values – Surface Soil

BTVs were calculated for the preliminary COPCs for background surface soil as described in Section 3.2 and are presented in Table 1. BTVs were used in the risk assessment to compare against Site concentrations. Any preliminary COPC for which the maximum detected concentrations in Site surface soils exceed the BTVs were retained for the two-sample hypothesis test.

4.1.3 Two-Sample Hypothesis Test – Surface Soil

A two-sample hypothesis test was conducted for each COPC retained following the comparison of BTVs to Site concentrations in the risk assessment (Table 2). Most of Site and background datasets were not normally distributed. Therefore, nonparametric tests (Wilcoxon or Tarone-Ware tests) were selected based on the presence of non-detects in the dataset as detailed in Section 3.3. Both Site and background datasets were normally distributed for cobalt, lead, and manganese, and therefore, parametric t-tests were performed for those datasets.

The following table presents the COPCs for which the central tendency (i.e., median or mean concentrations) of Site and background surface soil datasets are consistent and were not retained for further evaluation in the risk

assessment. For all other COPCs, Site surface soil concentrations are significantly higher than background and were retained as COPCs.

Two-Sample Hypothesis Test Outcome	COPCs Not Retained
Null hypothesis accepted: Site concentration < or = background	**On-Project Blue Beach Area**: chromium, cobalt, manganese, mercury, nickel, silver, anthracene, benzo(a)pyrene, total HMW PAHs, total PAHs **Off-Project Red Maple Swamp / Tidal Stream Area**: chromium, lead, zinc, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, pyrene, total HMW PAHs, total PAHs

4.1.4 Geochemical Analysis – Surface Soil

A geochemical evaluation was performed for metals retained as COPCs based on the results of the two-sample hypothesis tests which concluded Site concentrations were greater than background. The metal COPCs retained in background surface soil include antimony, cadmium, copper, lead, and zinc.

Attachment D-2 presents the scatterplot examined for each metal COPC, the Kendall's tau correlation coefficient, its associated p-value, and the rationale to retain or eliminate the given metal COPC. No apparent geochemical correlations were observed for any of the metal COPCs evaluated in background surface soil. Therefore, these metals are retained as COPCs in the risk assessment.

4.2 Background Subsurface Soil

4.2.1 Outlier Determination – Subsurface Soil

The results of the outlier tests identified extreme values for arsenic and benzo(a)pyrene (Table 3). Based on review of the Trip Report, no errors were reported for the samples for which these values were identified. The extreme values were further evaluated by transforming the COPC datasets using natural log transformation and gamma correction and performing the outlier tests again on the transformed datasets.

- The extreme value identified for arsenic was also identified as an extreme value based on the transformed datasets, but no extreme values were identified for other metal COPCs for this sample (SB-404). Therefore, the value was not removed from the dataset.
- The extreme value identified for benzo(a)pyrene was not identified as an extreme value based on the log-transformed dataset. In addition, no extreme values were identified for other PAH COPCs for this sample (SB-411). Therefore, the value was not removed from the dataset.

4.2.2 Background Threshold Values – Subsurface Soil

BTVs were calculated for the preliminary COPCs for background subsurface soil as described in Section 3.2 and are presented in Table 3. BTVs were used in the risk assessment to compare against Site concentrations. Any preliminary COPC for which the maximum detected concentrations in Site surface soils exceed the BTVs were retained for the two-sample hypothesis test.

4.2.3 Two-Sample Hypothesis Test – Subsurface Soil

A two-sample hypothesis test was conducted for each COPC retained following the comparison of BTVs to Site concentrations (Table 4). Most of Site and background datasets were not normally distributed. Therefore, nonparametric tests (Wilcoxon or Tarone-Ware tests) were selected based on the presence of non-detects in the dataset as detailed in Section 3.3. Both Site (Off-Project Red Maple Swamp / Tidal Stream Area) and background datasets were normally distributed for arsenic, and therefore, a parametric t-test was performed for those datasets.

The following table presents the COPCs for which the central tendency (i.e., median or mean concentrations) of Site and background subsurface soil datasets are consistent and were not retained for further evaluation in the risk assessment. For all other COPCs, Site subsurface soil concentrations are significantly higher than background and were retained as COPCs.

Two-Sample Hypothesis Test Outcome	COPCs Not Retained
Null hypothesis accepted: Site concentration < or = background	**On-Project Blue Beach Area**: arsenic, copper, lead, manganese

A two-sample hypothesis test could not be conducted for benzo(a)pyrene due to low frequency of detection in Site samples. Site and background concentrations (including LODs for non-detects) were compared in a boxplot (Attachment D-2). The range of concentrations of both Site and background samples overlap, but the detected concentrations range higher in Site samples.

4.2.4 Geochemical Analysis – Subsurface Soil

A geochemical evaluation was performed for metals retained as COPCs in subsurface soil based on the results of the two-sample hypothesis tests which concluded Site concentrations were greater than background. The metal COPCs retained in background subsurface soil include antimony, arsenic, and cadmium.

Attachment D-2 presents the scatterplot examined for each metal COPC, the Kendall's tau correlation coefficient, its associated p-value, and the rationale to retain or eliminate the given metal COPC. The results of the analysis are summarized below.

- For subsurface soil in the On-Project Blue Beach Area, antimony and cadmium were evaluated. No apparent geochemical correlations were observed for any of the metals and they were retained as COPCs in the risk assessment.
- Although the two-sample hypothesis test conducted for arsenic in subsurface soil in the Off-Project Red Maple Swamp / Tidal Stream Area concluded Site concentrations were greater than background, Site concentrations of aluminum, iron, and manganese were not available and geochemical analysis could not be conducted.

4.3 Background Sediment – Tidal Stream North

4.3.1 Outlier Determination – Sediment (Tidal Stream)

The results of the outlier tests identified extreme values for copper, lead, and selenium (Table 5). Based on review of the Trip Report, no errors were reported for the samples for which these values were identified. The extreme values were further evaluated by transforming the COPC datasets using natural log transformation and gamma correction and performing the outlier tests again on the transformed datasets.

- The extreme values identified for copper, lead, and selenium were not identified as extreme values based on the tests performed with the transformed datasets, which suggests that the distribution of the datasets are influencing the outlier test outcome and the values identified are not true outliers for those datasets. In addition, no other extreme values were identified for metals COPCs for these samples. Therefore, the values were not removed from the datasets.

4.3.2 Background Threshold Values – Sediment (Tidal Stream)

BTVs were calculated for the preliminary COPCs for background sediment (tidal stream area) as described in Section 3.2 and are presented in Table 5. BTVs were used in the risk assessment to compare against Site concentrations. Any preliminary COPC for which the maximum detected concentrations in Site sediment in the Off-Project Red Maple Swamp / Tidal Stream Area exceed the BTVs were retained for the two-sample hypothesis test.

4.3.3 Two-Sample Hypothesis Test – Sediment (Tidal Stream)

A two-sample hypothesis test was conducted for each COPC retained following the comparison of BTVs to Site concentrations (Table 6). Most of Site and background datasets were not normally distributed. Therefore, nonparametric tests (Wilcoxon or Tarone-Ware tests) were selected based on the presence of non-detects in the dataset as detailed in Section 3.3. Both Site and background datasets were normally distributed for beryllium, and therefore, a parametric t-test was performed on those datasets.

The following table presents the COPCs for which the central tendency (i.e., median or mean concentrations) of Site and background sediment (tidal stream area) datasets are consistent and were not retained for further evaluation in the risk assessment. For two COPCs, cadmium and zinc, Site sediment concentrations are significantly higher than background and were retained as COPCs.

Two-Sample Hypothesis Test Outcome	**COPCs Not Retained**
Null hypothesis accepted: Site concentration < or = background	**Off-Project Red Maple Swamp / Tidal Stream Area**: aluminum, arsenic, barium, beryllium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenuium, silver, thallium, vanadium, and fluorene

4.3.4 Geochemical Analysis – Sediment (Tidal Stream)

A geochemical evaluation was performed for two metals retained as COPCs based on the results of the two-sample hypothesis tests which concluded Site concentrations were greater than background. The metal COPCs retained in background sediment (tidal stream area) include cadmium and zinc.

Attachment D-2 presents the scatterplot examined for each metal COPC, the Kendall's tau correlation coefficient, its associated p-value, and the rationale to retain or eliminate the given metal COPC. A positive, significant geochemical correlation was found between both metals and the reference element manganese. Therefore, cadmium and zinc were eliminated as COPCs in the risk assessment.

4.4 Background Sediment – Beachfront Area

4.4.1 Outlier Determination – Sediment (Beachfront Area)

The results of the outlier tests identified one extreme value for cobalt (Table 7). Based on review of the Trip Report, no errors were reported for the sample for which the extreme value was identified. This extreme value was further evaluated by transforming the COPC dataset using natural log transformation and gamma correction and performing the outlier tests again on the transformed datasets.

- The extreme value identified for cobalt was not an extreme value based on the tests performed with the transformed datasets, which suggests that the distribution of the dataset is influencing the outlier test outcome and the value identified is not a true outlier for this dataset. In addition, no other extreme values were identified for metals COPCs for this sample. Therefore, the value was not removed from the dataset.

4.4.2 Background Threshold Values – Sediment (Beachfront Area)

BTVs were calculated for the preliminary COPCs for background sediment (beachfront area) as described in Section 3.2 and are presented in Table 7. BTVs were used in the risk assessment to compare against Site concentrations. Any preliminary COPC for which the maximum detected concentrations in Site sediment in the Off-Project Narragansett Bay / Beachfront Area exceed the BTVs were retained for the two-sample hypothesis test.

4.4.3 Two-Sample Hypothesis Test – Sediment (Beachfront Area)

A two-sample hypothesis test was conducted for each COPC retained following the comparison of BTVs to Site concentrations (Table 8). Site datasets were not normally distributed. Therefore, nonparametric tests (Wilcoxon tests) were selected based on the presence of non-detects in the dataset as detailed in Section 3.3.

The following table presents the COPCs for which the central tendency (i.e., median or mean concentrations) of Site and background sediment (beachfront area) datasets are consistent and were not retained for further evaluation in the risk assessment.

Two-Sample Hypothesis Test Outcome	**COPCs Not Retained**
Null hypothesis accepted: Site concentration < or = background	**Off-Project Narragansett Bay / Beachfront Area**: aluminum, arsenic

4.5 Background Hydric Surface Soil

4.5.1 Outlier Determination – Hydric Surface Soil

The results of the outlier tests identified extreme values for arsenic, chromium, cobalt, copper, iron, manganese, mercury, benzo(a)fluoranthene, chrysene, pyrene, total HMW PAHs, and total PAHs (Table 9). Based on review of the Trip Report, no errors were reported for the samples for which extreme values were identified. The listed COPCs were further evaluated by transforming the COPC datasets using natural log transformation and gamma correction and performing the outlier tests again on the transformed datasets.

- The extreme values identified for arsenic, chromium, cobalt, copper, iron, and manganese were identified as extreme values for the same sample (SSH-313) based on the tests performed with the transformed datasets. Therefore, these values were determined to be outliers for these COPCs and were removed from the datasets.
- The extreme value for mercury was not identified as an extreme value based on the transformed datasets, and no extreme values were identified for other metal COPCs for this sample (SSH-314). Therefore, the value was not removed from the dataset.
- The extreme values identified for benzo(a)fluoranthene, chrysene, pyrene, total HMW PAHs, and total PAHs were identified for the same sample (SSH-315). However, these values were not identified as extreme values based on the tests performed with the transformed datasets, which suggests that the distribution of the datasets are influencing the outlier test outcome and the values identified are not true outliers for these datasets. Therefore, the values were not removed from these datasets.

The extreme values identified for arsenic, chromium, cobalt, copper, iron, and manganese were determined to be outliers and the values removed from the datasets prior to BTV calculation, two-sample hypothesis test, and the geochemical analysis.

4.5.2 Background Threshold Values – Hydric Surface Soil

BTVs were calculated for the preliminary COPCs for background surface soil as described in Section 3.2 and are presented in Table 9. BTVs were used in the risk assessment to compare against Site concentrations. Any preliminary COPC for which the maximum detected concentrations in Site hydric surface soils exceed the BTVs were retained for the two-sample hypothesis test.

4.5.3 Two-Sample Hypothesis Test – Hydric Surface Soil

A two-sample hypothesis test was conducted for each COPC retained following the comparison of BTVs to Site concentrations (Table 10). Most of Site and background datasets were not normally distributed. Therefore, nonparametric tests (Wilcoxon or Tarone-Ware tests) were selected based on the presence of non-detects in the dataset as detailed in Section 3.3. Both Site and background datasets were normally distributed for arsenic, chromium, copper, iron, lead, vanadium, and zinc, and therefore, parametric t-tests were performed for those datasets.

The following table presents the COPCs for which the central tendency (i.e., median or mean concentrations) of Site and background hydric surface soil datasets are consistent and were not retained for further evaluation in the risk assessment. For all other COPCs, Site hydric surface soil concentrations are significantly higher than background and were retained as COPCs.

Two-Sample Hypothesis Test Outcome	**COPCs Not Retained**
Null hypothesis accepted: Site concentration < or = background	**Off-Project Red Maple Swamp / Tidal Stream Area**: manganese, anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, pyrene, total HMW PAHs

A two-sample hypothesis test could not be conducted for thallium due to low frequency of detection in background samples. Site and background concentrations (including LODs for non-detects) were compared in a boxplot (Attachment D-2). The range of concentrations of both Site and background samples overlap, but the detected concentrations are higher in Site samples.

4.5.4 Geochemical Analysis – Hydric Surface Soil

A geochemical evaluation was performed for metals retained as COPCs based on the results of the two-sample hypothesis tests which concluded Site concentrations were greater than background. The metal COPCs retained in background hydric surface soil include aluminum, arsenic, chromium, cobalt, copper, iron, lead, manganese, mercury, selenium, vanadium, and zinc.

Attachment D-2 presents the scatterplot examined for each metal COPC, the Kendall's tau correlation coefficient, its associated p-value, and the rationale to retain or eliminate the given metal COPC. The results of the evaluation are summarized below:

- A positive, significant geochemical correlation with one or more of the reference elements was found for aluminum, chromium, cobalt, iron, manganese, vanadium, and zinc. These metals were eliminated as COPCs in the risk assessment.
- No apparent geochemical correlations were observed for arsenic, copper, lead, mercury, and selenium. These metals are retained as COPCs in the risk assessment.

4.6 Background Hydric Subsurface Soil

4.6.1 Outlier Determination – Hydric Subsurface Soil

The results of the outlier tests identified extreme values for arsenic, cobalt, and iron (Table 11). Based on review of the Trip Report, no errors were reported for the sample for which these values were identified. The extreme values were further evaluated by transforming the COPC datasets using natural log transformation and gamma correction and performing the outlier tests again on the transformed datasets.

- The extreme values identified for arsenic, cobalt, and iron were identified as extreme values for the same sample (SSH-313) based on the tests performed with the transformed datasets. Therefore, these extreme values were removed from the dataset.

The extreme values identified for arsenic, cobalt, and iron were determined to be outliers and were removed from the datasets prior to BTV calculation, two-sample hypothesis test, and the geochemical analysis.

4.6.2 Background Threshold Values – Hydric Subsurface Soil

BTVs were calculated for the preliminary COPCs for background surface soil as described in Section 3.2 and are presented in Table 11. BTVs were used in the risk assessment to compare against Site concentrations. Any preliminary COPC for which the maximum detected concentrations in Site hydric subsurface soils exceed the BTVs were retained for the two-sample hypothesis test.

4.6.3 Two-Sample Hypothesis Test – Hydric Subsurface Soil

A two-sample hypothesis test was conducted for each COPC retained following the comparison of BTVs to Site concentrations (Table 12). Background datasets for arsenic and iron were not normally distributed and therefore, nonparametric tests (Wilcoxon tests) were selected based on the presence of non-detects in the dataset as detailed in Section 3.3. Both Site and background datasets were normally distributed for cobalt and vanadium, and therefore, parametric t-tests were performed for those datasets.

For all COPCs, Site hydric subsurface soil concentrations are significantly higher than background and were retained as COPCs.

A two-sample hypothesis test could not be conducted for thallium due to low frequency of detection in background samples. Site and background concentrations (including LODs for non-detects) were compared in a boxplot

(Attachment D-2). The range of concentrations of both Site and background samples overlap, but the detected concentrations are higher in Site samples.

4.6.4 Geochemical Analysis – Hydric Subsurface Soil

A geochemical evaluation was performed for metals retained as COPCs based on the results of the two-sample hypothesis tests which concluded Site concentrations were greater than background. The metal COPCs retained in background hydric subsurface soil include arsenic, cobalt, iron, and vanadium.

Attachment D-2 presents the scatterplot examined for each metal COPC, the Kendall's tau correlation coefficient, its associated p-value, and the rationale to retain or eliminate the given metal COPC. A positive, significant geochemical correlation with one or more of the reference elements was found for arsenic, cobalt, iron, and vanadium. These metals were eliminated as COPCs in the risk assessment.

5. Summary and Conclusions

This appendix presents the results of the background evaluation. Specifically, it provides a description of the background sediment samples collected upstream of the site that were selected to represent background conditions. In addition, the methodology and results of the background conditions data evaluation are presented, including the identification of outlier values, the comparison of Site and background datasets, and the calculation of BTVs.

Representative soil, hydric soil, and sediment background were collected in May 2020 at Rome Point State Park in North Kingstown, Rhode Island, which is located on Narragansett Bay with similar shoreline features but has not been impacted by past military operations as the former Blue Beach Disposal Area. Representative sediment was also collected in the upstream portion of the Off-Project Red Maple Swamp / tidal stream area, which is upgradient and outside of the Site-related influence. Soil and sediment background samples were collected at the same depth intervals as Site samples. The background datasets were validated and qualified prior to use in the risk assessment and the background evaluation, and statistics and totals were calculated in the same manner as Site data.

Preliminary COPCs were identified for each exposure media and area in the risk assessment. The background datasets for these preliminary COPCs were evaluated for the presence of outliers based both on the statistical outlier tests and on additional evidence including evidence of field sampling or laboratory analysis errors, an evaluation of data transformations on the outcome of the outlier tests, and the presence of other outliers identified within the same chemical group (e.g., metals, PAHs) for the same sample. Outlier values were identified for three samples: a surface soil sample, a hydric surface soil sample, and a hydric subsurface soil sample, and extreme values determined to be outliers for these samples were removed from the datasets prior to BTV calculation, two-sample hypothesis test, and the geochemical analysis.

Media	**COPCs with Outlier Values Removed from Datasets**
Surface soil (SB-412)	Anthracene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, pyrene, total HMW PAHs, and total PAHs
Hydric surface soil (SSH-313)	Arsenic, chromium, cobalt, copper, iron, and manganese
Hydric subsurface soil (SSH-313)	Arsenic, cobalt, and iron

BTVs were calculated for preliminary COPCs and compared to Site concentrations in the risk assessment. Any preliminary COPC for which Site concentrations are less than the BTVs were eliminated from the risk assessment.

A two-sample hypothesis test was conducted for each COPC retained following the comparison of BTVs to Site concentrations in the risk assessment. The two-sample hypothesis test compared the central tendency (i.e., the mean or median) of the Site and background datasets and identify the COPCs for which Site and background concentrations are consistent. The following table presents the COPCs for which the central tendency (i.e., median or mean concentrations) of Site datasets are less than or equal to background datasets and were not retained for further evaluation in the risk assessment. COPCs were eliminated for all exposure media and areas with the exception of hydric subsurface soil for which no COPCs were eliminated based on the two-sample hypothesis test results.

Media	COPCs Not Retained Based on Two-Sample Hypothesis Tests
Surface Soil	**On-Project Blue Beach Area**: chromium, cobalt, manganese, mercury, nickel, silver, anthracene, benzo(a)pyrene, total HMW PAHs, total PAHs **Off-Project Red Maple Swamp / Tidal Stream Area:** chromium, lead, zinc, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, pyrene, total HMW PAHs, total PAHs
Subsurface Soil	**On-Project Blue Beach Area:** arsenic, copper, lead, manganese
Sediment	**Off-Project Red Maple Swamp / Tidal Stream Area:** aluminum, arsenic, barium, beryllium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenuium, silver, thallium, vanadium, and fluorene **Off-Project Narragansett Bay / Beachfront Area:** aluminum, arsenic
Hydric Surface Soil	**Off-Project Red Maple Swamp / Tidal Stream Area:** manganese, anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, pyrene, total HMW PAHs

The last step in the background evaluation was the geochemical evaluation, which was performed for metals retained as COPCs based on the results of the two-sample hypothesis tests which concluded Site concentrations were greater than background. This evaluation is based on processes that transport and redistribute naturally-occurring chemicals, particularly metals, during soil formation whereby constituents can incorporate with secondary minerals including aluminum, iron, and manganese (reference elements). Correlations between the reference elements and COPCs were examined using scatterplots and pairwise correlations. Significant, positive correlations between reference elements and COPCs in background and Site indicated the COPC is naturally occurring and eliminated from the HHRA and ERA. The following COPCs were eliminated from the risk assessment on the basis of the geochemical evaluation as follows:

Media	COPCs Not Retained Based on Two-Sample Hypothesis Tests
Sediment	**Off-Project Red Maple Swamp / Tidal Stream Area:** cadmium and zinc
Hydric Surface Soil	**Off-Project Red Maple Swamp / Tidal Stream Area:** aluminum, chromium, cobalt, iron, manganese, vanadium, and zinc
Hydric Subsurface Soil	**Off-Project Red Maple Swamp / Tidal Stream Area:** arsenic, cobalt, iron, and vanadium

6. References

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Tables

ATTACHMENT D TABLE 1
OUTLIER DETERMINATION AND CALCULATION OF BACKGROUND THRESHOLD VALUES FOR COPCS IN BACKGROUND SURFACE SOIL
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC	Background FOD (a)	Maximum Detected Concentration (mg/kg) (a)	Extreme Value (mg/kg) (b)	Sample Identification of Extreme Value	Outlier Determination (c)	BTV (mg/kg) (d)	BTV Statistic
Inorganics							
Aluminum	20 / 20	13800	--	--	--	13935	Normal: 95% UTL with 95% Coverage
Antimony	19 / 20	0.14	0.14	SB-406	Not outlier (e)	0.14	Nonparametric: 95UTL = Max
Arsenic	20 / 20	5.97	5.97	SB-406	Not outlier (f)	5.97	Nonparametric: 95% UTL with 95% Coverage
Cadmium	20 / 20	0.142	--	--	--	0.142	Gamma: 95% WH UTL with 95% Coverage
Chromium	20 / 20	11.8	--	--	--	11.8	Nonparametric: 95UTL = Max
Cobalt	20 / 20	6.32	--	--	--	5.854	Normal: 95% UTL with 95% Coverage
Copper	20 / 20	17.3	--	--	--	17.02	Normal: 95% UTL with 95% Coverage
Iron	20 / 20	17600	--	--	--	18278	Normal: 95% UTL with 95% Coverage
Lead	20 / 20	34.2	--	--	--	35	Normal: 95% UTL with 95% Coverage
Manganese	20 / 20	207	--	--	--	219.2	Normal: 95% UTL with 95% Coverage
Mercury	17 / 20	0.054	0.0542 (upper tail), 0.0072 (lower tail)	SB-413, SB-417	Not outlier (f)	0.058	Normal: 95% KM UTL with 95% Coverage
Nickel	20 / 20	10.7	--	--	--	11.11	Normal: 95% UTL with 95% Coverage
Selenium	20 / 20	0.44	--	--	--	0.51	Normal: 95% UTL with 95% Coverage
Silver	20 / 20	0.194	--	--	--	0.181	Normal: 95% UTL with 95% Coverage
Thallium	20 / 20	0.181	--	--	--	0.178	Normal: 95% UTL with 95% Coverage
Vanadium	20 / 20	19.6	--	--	--	19.6	Nonparametric: 95% UTL with95% Coverage
Zinc	20 / 20	51.4	--	--	--	50.13	Normal: 95% UTL with 95% Coverage
SVOCs							
Anthracene	11 / 19	0.021	0.037	SB-412	Value removed (g)	0.021	Gamma: 95% KM WH UTL with 95% Coverage
Benzo(a)anthracene	20 / 20	0.26	0.26	SB-412	Not outlier (h)	0.23	Gamma: 95% WH UTL with 95% Coverage
Benzo(a)Pyrene	19 / 20	0.28	0.28	SB-412	Not outlier (h)	0.23	Gamma: 95% KM WH UTL with 95% Coverage
Benzo(b)fluoranthene	19 / 19	0.14	0.42	SB-412	Value removed (g)	0.23	Gamma: 95% WH UTL with 95% Coverage
Benzo(g,h,i)Perylene	20 / 20	0.19	0.19	SB-412	Not outlier (h)	0.16	Gamma: 95% WH UTL with 95% Coverage
Chrysene	17 / 19	0.10	0.31	SB-412	Value removed (g)	0.17	Gamma: 95% KM WH UTL with 95% Coverage
Dibenzo(a,h)Anthracene	14 / 19	0.02	0.064	SB-412	Value removed (g)	0.030	Gamma: 95% KM WH UTL with 95% Coverage
Indeno(1,2,3-CD)Pyrene	20 / 20	0.16	0.16	SB-412	Not outlier (h)	0.13	Gamma: 95% WH UTL with 95% Coverage
Pyrene	19 / 19	0.18	0.67	SB-412	Value removed (g)	0.31	Gamma: 95% WH UTL with 95% Coverage
Total HMW PAHs	19 / 19	0.95	2.90	SB-412	Value removed (g)	1.59	Gamma: 95% WH UTL with 95% Coverage
Total PAHs	19 / 19	1.10	3.30	SB-412	Value removed (g)	1.73	Gamma: 95% WH UTL with 95% Coverage

Notes:

BTV - Background Threshold Value.

COPC - Chemical of Potential Concern.

FOD - Frequency of Detection. The number of detected concentrations: the total number of samples.

HMW - High Molecular Weight.

ATTACHMENT D TABLE 1
OUTLIER DETERMINATION AND CALCULATION OF BACKGROUND THRESHOLD VALUES FOR COPCS IN BACKGROUND SURFACE SOIL
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC	Background FOD (a)	Maximum Detected Concentration (mg/kg) (a)	Extreme Value (mg/kg) (b)	Sample Identification of Extreme Value	Outlier Determination (c)	BTV (mg/kg) (d)	BTV Statistic

KM - Kaplan Meier.

mg/kg - milligrams per kilogram.

PAH - Polycyclic aromatic hydrocarbons.

SVOCs - Semivolatile organic compounds.

USEPA - United States Environmental Protection Agency.

UTL - Upper Threshold Value.

(a) The maximum detected concentration and FOD of the background dataset following removal of outlier values.

(b) Extreme values identified by the default outlier test in ProUCL (version 5.1; USEPA, 2016) was conducted (Dixon's test for under 25 samples).

(c) Extreme values were further evaluated by data transformations (natural log and gamma correction): if the value was identified as an extreme value following the data transformations and additional extreme values were identified for the sample for the same group of COPCs (e.g., SVOCs), this value was determined to be an outlier and removed from the dataset. If the value was not identified as an extreme value based on the outlier test results of the transformed datasets and additional extreme values were not identified for the sample for the same group of COPCs, the value is not an outlier and was not removed from the dataset.

(d) BTVs were calculated in ProUCL (version 5.1; USEPA, 2016). The 95UTL was selected based on the distribution of the detected concentrations in the dataset.
If the dataset includes non-detects, the non-detects were included at the full value of the detection limit and the BTV was selected from the Kaplan-Meier (KM) statistics.
For gamma UTLs, the Wilson Hilferty (WH) statistic was selected.

(e) The value was identified as an extreme value based on the outlier test results of the transformed datasets. However, the sample was not identified as an extreme value for most other metals (with the exception of arsenic discussed below). Therefore, the value was not removed from the dataset.

(f) The values were not identified as extreme values based on the outlier test results of the transformed datasets. In addition, extreme values were not identified for most (with exception of antimony) or all other metals of this sample. Therefore, the value was not removed from the dataset.

(g) The value was identified as an extreme value based on the outlier test results of the transformed datasets. Therefore, the value was removed from the dataset.

(h) The value was not identified as an extreme value based on the outlier test results of the transformed datasets. Therefore, the value was not removed from the dataset.

ATTACHMENT D TABLE 2

COMPARISON OF CHEMICAL CONCENTRATIONS IN BACKGROUND AND SITE SURFACE SOIL

BACKGROUND EVALUATION

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

COPC (a)	FOD		Distribution		Mean/Median (SD) (mg/kg)		Population Test	p-value	Reject the Null Hypothesis? (c)
	Site	Background	Site	Background	Site (b)	Background (b)			
On-Project Blue Beach Area									
Inorganics									
Antimony	27 / 27	19 / 20	Not Normal	Not Normal	0.098 (0.61)	0.0505 (0.025)	WMW	3E-05	Yes
Cadmium	26 / 27	20 / 20	Not Normal	Not Normal	0.324 (2.317)	0.056 (0.0281)	WMW	1E-06	Yes
Chromium	27 / 27	20 / 20	Not Normal	Not Normal	8.43 (7.42)	9.58 (2.696)	WMW	0.6	No
Cobalt	27 / 27	20 / 20	Normal	Normal	2.917 (1.243)	3.287 (1.071)	t-test	0.9	No
Copper	27 / 27	20 / 20	Not Normal	Normal	9.4 (25.23)	7.455 (3.749)	WMW	0.03	Yes
Lead	27 / 27	20 / 20	Not Normal	Normal	43.1 (87.85)	19.8 (7.228)	WMW	0.001	Yes
Manganese	27 / 27	20 / 20	Normal	Normal	106.7 (38.05)	133.5 (35.76)	t-test	1.0	No
Mercury	21 / 27	17 / 20	Not Normal	Normal	0.025 (0.461)	0.03 (0.0106)	Tarone-Ware	0.9	No
Nickel	27 / 27	20 / 20	Not Normal	Normal	5.73 (12.27)	6.275 (1.968)	WMW	0.8	No
Silver	26 / 27	20 / 20	Not Normal	Normal	0.0714 (2.24)	0.061 (0.0473)	WMW	0.2	No
Zinc	27 / 27	20 / 20	Not Normal	Normal	42.5 (86.69)	29.65 (8.49)	WMW	6.7E-05	Yes
SVOCs									
Anthracene	23 / 27	11 / 19	Not Normal	Not Normal	0.005 (0.015)	0.0041 (0.006)	Tarone-Ware	0.4	No
Benzo(a)Pyrene	26 / 27	19 / 20	Not Normal	Not Normal	0.0495 (0.104)	0.022 (0.0644)	Tarone-Ware	0.09	No
Dibenzo(a,h)Anthracene	24 / 27	14 / 19	Not Normal	Not Normal	0.011 (0.0269)	0.0068 (0.007)	Tarone-Ware	0.04	Yes
Total HMW PAHs	27 / 27	19 / 19	Not Normal	Not Normal	0.47 (0.959)	0.24 (0.32)	WMW	0.08	No
Total PAHs	27 / 27	19 / 19	Not Normal	Not Normal	0.55 (1.046)	0.31 (0.36)	WMW	0.07	No
Off-Project Red Maple Swamp / Tidal Stream Area									
Chromium	16 / 16	20 / 20	Not Normal	Not Normal	4.83 (2.519)	9.58 (2.696)	WMW	1.0	No
Lead	16 / 16	20 / 20	Normal	Normal	20.36 (7.544)	17.68 (7.228)	t-test	0.1	No
Zinc	10 / 10	20 / 20	Not Normal	Normal	35.8 (27.4)	29.65 (8.49)	WMW	0.2	No
SVOCs									
Anthracene	6 / 10	11 / 19	Not Normal	Not Normal	0.00865 (0.108)	0.004 (0.006)	Tarone-Ware	0.1	No
Benzo(a)anthracene	10 / 10	20 / 20	Not Normal	Not Normal	0.034 (0.652)	0.0203 (0.0599)	WMW	0.2	No
Benzo(a)Pyrene	10 / 10	19 / 20	Not Normal	Not Normal	0.044 (0.655)	0.022 (0.0644)	WMW	0.1	No
Benzo(b)fluoranthene	10 / 10	19 / 19	Not Normal	Not Normal	0.0635 (0.685)	0.033 (0.046)	WMW	0.1	No
Benzo(g,h,i)Perylene	10 / 10	20 / 20	Not Normal	Not Normal	0.035 (0.372)	0.0163 (0.0426)	WMW	0.09	No
Chrysene	10 / 10	17 / 19	Not Normal	Not Normal	0.0455 (0.465)	0.031 (0.035)	Tarone-Ware	0.4	No
Dibenzo(a,h)Anthracene	7 / 10	14 / 19	Not Normal	Not Normal	0.018 (0.0753)	0.0068 (0.007)	Tarone-Ware	0.07	No
Indeno(1,2,3-CD)Pyrene	10 / 10	20 / 20	Not Normal	Not Normal	0.033 (0.372)	0.0148 (0.036)	WMW	0.1	No
Pyrene	10 / 10	19 / 19	Not Normal	Not Normal	0.059 (1.227)	0.034 (0.063)	WMW	0.4	No
Total HMW PAHs	10 / 10	19 / 19	Not Normal	Not Normal	0.405 (5.599)	0.24 (0.32)	WMW	0.2	No
Total PAHs	10 / 10	19 / 19	Not Normal	Not Normal	0.47 (5.908)	0.31 (0.36)	WMW	0.2	No

ATTACHMENT D TABLE 2

COMPARISON OF CHEMICAL CONCENTRATIONS IN BACKGROUND AND SITE SURFACE SOIL

BACKGROUND EVALUATION

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

COPC (a)	FOD		Distribution		Mean/Median (SD) (mg/kg)		Population Test	p-value	Reject the Null Hypothesis? (c)
	Site	Background	Site	Background	Site (b)	Background (b)			

Notes:

COPC - Chemical of Potential Concern.

FOD - Frequency of Detection. The number of detected concentrations: the total number of samples.

HMW - High Molecular Weight.

mg/kg - milligrams per kilogram.

PAH - Polycyclic aromatic hydrocarbons.

SD - Standard deviation.

SVOCs - Semivolatile organic compounds.

WMW - Wilcoxon test.

(a) COPCs retained after comparison of Site maximum detect concentrations to background threshold values in the risk assessment.

(b) The mean (calculated for COPCs for which a t-test was conducted), median (calculated for COPCs for which a Wilcoxon or Tarone-Ware test was conducted) and the standard deviation (in parentheses) of the detected concentrations in Site and background.

(c) The null and alternative hypotheses of the hypothesis test are:

H_o (null): the Site mean concentration is less than or equal to the mean concentration in the background area ($p > 0.05$: fail to reject H_o)

H_a (alternative): The Site mean concentration is greater than the mean concentration in the background area ($p < 0.05$: reject H_o)

ATTACHMENT D TABLE 3
OUTLIER DETERMINATION AND CALCULATION OF BACKGROUND THRESHOLD VALUES FOR COPCS IN BACKGROUND SUBSURFACE SOIL
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical	Background FOD (a)	Maximum Detected Concentration (mg/kg) (a)	Extreme Value (mg/kg) (b)	Sample Identification of Extreme Value	Outlier Determination (c)	BTV (mg/kg) (d)	Statistic
Inorganics							
Aluminum	20 / 20	13300	--	--	--	14785	Normal: 95% UTL with 95% Coverage
Antimony	19 / 20	0.065	--	--	--	0.0685	Normal: 95% KM UTL with 95% Coverage
Arsenic	20 / 20	4.03	4.03	SB-404	Not outlier (e)	3.81	Gamma: 95% UTL with 95% Coverage
Cadmium	20 / 20	0.0812	--	--	--	0.0904	Normal: 95% UTL with 95% Coverage
Cobalt	20 / 20	7.37	--	--	--	8.859	Gamma: 95% UTL with 95% Coverage
Copper	20 / 20	13.7	--	--	--	15.04	Normal: 95% UTL with 95% Coverage
Iron	20 / 20	19700	--	--	--	19688	Normal: 95% UTL with 95% Coverage
Lead	20 / 20	54	--	--	--	62.67	Lognormal: 95% UTL 95% Coverage
Manganese	20 / 20	218	--	--	--	241.4	Normal: 95% UTL with 95% Coverage
Thallium	20 / 20	0.167	--	--	--	0.182	Normal: 95% UTL with 95% Coverage
SVOCs							
Benzo(a)Pyrene	11 / 20	0.80	0.80	SB-411	Not outlier (e)	0.52	Lognormal: 95% KM UTL 95% Coverage
Naphthalene	5 / 20	0.014	--	--	--	0.0133	Normal: 95% KM UTL with 95% Coverage

Notes:

BTV - Background Threshold Value.

COPC - Chemical of Potential Concern.

FOD - Frequency of Detection. The number of detected concentrations: the total number of samples.

HMW - High Molecular Weight.

KM - Kaplan Meier.

mg/kg - milligrams per kilogram.

PAH - Polycyclic aromatic hydrocarbons.

SVOCs - Semivolatile organic compounds.

USEPA - United States Environmental Protection Agency.

UTL - Upper Threshold Value.

(a) The maximum detected concentration and FOD of the background dataset following removal of outlier values.

(b) Extreme values identified by the default outlier test in ProUCL (version 5.1; USEPA, 2016) was conducted (Dixon's test for under 25 samples).

(c) Extreme values were further evaluated by data transformations (natural log and gamma correction): if the value was identified as an extreme value following the data transformations and additional extreme value were identified for the sample for the same group of COPCs (e.g., SVOCs), this value was determined to be an outlier and removed from the dataset. If the value was not identified as an extreme value based on the outlier test results of the transformed datasets and additional extreme values were not identified for the sample for the same group of COPCs, the value is not an outlier and was not removed from the datase

(d) BTVs were calculated in ProUCL (version 5.1; USEPA, 2016). The 95UTL was selected based on the distribution of the detected concentrations in the dataset.

If the dataset includes non-detects, the non-detects were included at the full value of the detection limit and the BTV was selected from the Kaplan-Meier (KM) statistics.

For gamma UTLs, the Wilson Hilferty (WH) statistic was selected.

(e) The value was not identified as an extreme value based on the outlier test results of the transformed datasets. In addition, extreme values were not identified for other COPCs in the same group (metals or SVOCs) of this sample. Therefore, the value was not removed from the dataset.

ATTACHMENT D TABLE 4
COMPARISON OF CHEMICAL CONCENTRATIONS IN BACKGROUND AND SITE SUBSURFACE SOIL
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC (a)	FOD		Distribution		Mean/Median (SD) (mg/kg)		Population Test	p-value	Reject the Null Hypothesis? (c)
	Site	Background	Site	Background	Site (b)	Background (b)			
On-Project Blue Beach Area									
Antimony	26 / 27	19 / 20	Not Normal	Normal	0.086 (0.741)	0.041 (0.0118)	Tarone-Ware	0.013	Yes
Arsenic	37 / 37	20 / 20	Not Normal	Not Normal	1.78 (1.499)	2.38 (0.528)	WMW	1.0	No
Cadmium	32 / 37	20 / 20	Not Normal	Normal	0.243 (1.795)	0.0465 (0.0172)	Tarone-Ware	7.6E-06	Yes
Copper	27 / 27	20 / 20	Not Normal	Normal	7.9 (165.9)	7.665 (2.792)	WMW	0.5	No
Lead	37 / 37	20 / 20	Not Normal	Not Normal	18.1 (203.3)	13.3 (12.68)	WMW	0.3	No
Manganese	27 / 27	20 / 20	Not Normal	Normal	92.6 (46.87)	130 (40.86)	WMW	1	No
Off-Project Red Maple Swamp / Tidal Stream Area									
Inorganics									
Arsenic	6 / 6	20 / 20	Normal	Normal	4.467 (1.857)	2.462 (0.528)	t-test	0	Yes
SVOCs									
Benzo(a)Pyrene	2 / 16	11 / 20	NC	Not Normal	0.75 (0.15)	0.13 (0.23)	NC	NC	NC
Naphthalene	13 / 16	5 / 20	Not Normal	Normal	0.7 (4.018)	0.0073 (0.00447)	Tarone-Ware	5.5E-08	Yes

Notes:

COPC - Chemical of Potential Concern.

FOD - Frequency of Detection. The number of detected concentrations: the total number of samples.

mg/kg - milligrams per kilogram.

NC - Not calculated

SD - Standard deviation.

SVOCs - Semivolatile organic compounds.

WMW - Wilcoxon test.

(a) COPCs retained after comparison of Site maximum detect concentrations to background threshold values in the risk assessment.

(b) The mean (calculated for COPCs for which a t-test was conducted), median (calculated for COPCs for which a Wilcoxon or Tarone-Ware test was conducted) and the standard deviation (in parentheses) of the detected concentrations in Site and background.

(c) The null and alternative hypotheses of the hypothesis test are:

H_o (null): the Site mean concentration is less than or equal to the mean concentration in the background area ($p > 0.05$: fail to reject H_o)

H_a (alternative): The Site mean concentration is greater than the mean concentration in the background area ($p < 0.05$: reject H_o)

ATTACHMENT D TABLE 5
OUTLIER DETERMINATION AND CALCULATION OF BACKGROUND THRESHOLD VALUES FOR COPCS IN
BACKGROUND SEDIMENT - TIDAL STREAM NORTH
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical	Background FOD (a)	Maximum Detected Concentration (mg/kg) (a)	Extreme Value (mg/kg) (b)	Sample Identification of Extreme Value	Outlier Determination (c)	BTV (mg/kg) (d)	Statistic
Inorganics							
Aluminum	5 / 5	7890	--	--	--	11424	Normal: 95% UTL with 95% Coverage
Arsenic	7 / 7	4.7	--	--	--	7.1	Normal: 95% UTL with 95% Coverage
Barium	7 / 7	22.2	--	--	--	36.10	Normal: 95% UTL with 95% Coverage
Beryllium	5 / 5	0.6	--	--	--	0.96	Normal: 95% UTL with 95% Coverage
Cadmium	5 / 7	0.104	--	--	--	0.146	Normal: 95% KM UTL with 95% Coverage
Chromium	7 / 7	10.8	--	--	--	16.49	Normal: 95% UTL with 95% Coverage
Cobalt	5 / 5	3.15	--	--	--	4.418	Normal: 95% UTL with 95% Coverage
Copper	7 / 7	13.4	6.27 (lower tail)	SED-325	Not outlier (e)	22.53	Normal: 95% UTL with 95% Coverage
Iron	5 / 5	9610	--	--	--	11127	Normal: 95% UTL with 95% Coverage
Lead	7 / 7	54.2	54.2 (upper tail)	SED-101-2014	Not outlier (e)	76.11	Normal: 95% UTL with 95% Coverage
Manganese	5 / 5	127	--	--	--	192.6	Normal: 95% UTL with 95% Coverage
Mercury	7 / 7	0.053	--	--	--	0.0801	Normal: 95% UTL with 95% Coverage
Nickel	5 / 5	7.3	--	--	--	11.44	Normal: 95% UTL with 95% Coverage
Selenium	6 / 7	0.6	0.6 (upper tail)	SED 1	Not outlier (e)	0.81	Normal: 95% KM UTL with 95% Coverage
Silver	5 / 7	0.057	--	--	--	0.0881	Normal: 95% KM UTL with 95% Coverage
Thallium	5 / 5	0.12	--	--	--	0.172	Normal: 95% UTL with 95% Coverage
Vanadium	5 / 5	14.2	--	--	--	20.98	Normal: 95% UTL with 95% Coverage
Zinc	5 / 5	60.1	--	--	--	79.74	Normal: 95% UTL with 95% Coverage
PCBs							
Aroclor 1260	2 / 7	0.1	--	--	--	NC	--
Total PCB Aroclors	2 / 7	0.4	--	--	--	NC	--
SVOCs							
1-Methylnaphthalene	1 / 5	0.004	--	--	--	NC	--
2-Methylnaphthalene	1 / 6	0.004	--	--	--	NC	--
Acenaphthene	4 / 6	0.035	--	--	--	0.06	Normal: 95% KM UTL with 95% Coverage
Acenaphthylene	1 / 6	0.004	--	--	--	NC	--
Anthracene	6 / 6	0.256	--	--	--	0.46	Normal: 95% UTL with 95% Coverage
Benzo(a)anthracene	6 / 6	2.64	--	--	--	5.179	Normal: 95% UTL with 95% Coverage
Benzo(a)Pyrene	6 / 6	4.3	--	--	--	8.329	Normal: 95% UTL with 95% Coverage
Benzo(b)fluoranthene	6 / 6	7.2	--	--	--	13.97	Normal: 95% UTL with 95% Coverage
Benzo(g,h,i)Perylene	6 / 6	3.0	--	--	--	5.511	Normal: 95% UTL with 95% Coverage
Benzo(k)Fluoranthene	6 / 6	2.6	--	--	--	5.069	Normal: 95% UTL with 95% Coverage
Chrysene	6 / 6	4.7	--	--	--	9.394	Normal: 95% UTL with 95% Coverage
Dibenzo(a,h)Anthracene	6 / 6	0.66	--	--	--	1.214	Normal: 95% UTL with 95% Coverage
Fluoranthene	6 / 6	8.47	--	--	--	16.6	Normal: 95% UTL with 95% Coverage
Fluorene	5 / 6	0.064	--	--	--	0.123	Normal: 95% KM UTL with 95% Coverage
Indeno(1,2,3-CD)Pyrene	6 / 6	4.4	--	--	--	7.506	Normal: 95% KM UTL with 95% Coverage

ATTACHMENT D TABLE 5
OUTLIER DETERMINATION AND CALCULATION OF BACKGROUND THRESHOLD VALUES FOR COPCS IN
BACKGROUND SEDIMENT - TIDAL STREAM NORTH
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical	Background FOD (a)	Maximum Detected Concentration (mg/kg) (a)	Extreme Value (mg/kg) (b)	Sample Identification of Extreme Value	Outlier Determination (c)	BTV (mg/kg) (d)	Statistic
Naphthalene	2 / 6	0.017	--	--	--	NC	--
Phenanthrene	6 / 6	2.4	--	--	--	5.028	Normal: 95% KM UTL with 95% Coverage
Pyrene	6 / 6	8.2	--	--	--	14.84	Normal: 95% KM UTL with 95% Coverage
Total High MW PAHs	6 / 6	45.0	--	--	--	85.06	Normal: 95% KM UTL with 95% Coverage
Total Low MW PAHs	6 / 6	3.8	--	--	--	6.895	Normal: 95% KM UTL with 95% Coverage
Total PAHs	6 / 6	48	--	--	--	91.87	Normal: 95% KM UTL with 95% Coverage
Bis-(2-Ethylhexyl)-Phtha	3 / 5	0.324	--	--	--	NC	--
Carbazole	5 / 6	0.62	--	--	--	1.035	Normal: 95% KM UTL with 95% Coverage
VOCs							
2-Butanone (MEK)	1 / 2	0.0	--	--	--	NC	--
Acetone	1 / 2	0.1	--	--	--	NC	--

Notes:

BTV - Background Threshold Value.

COPC - Chemical of Potential Concern.

FOD - Frequency of Detection. The number of detected concentrations: the total number of samples.

HMW - High Molecular Weight.

KM - Kaplan Meier.

mg/kg - milligrams per kilogram.

PAH - Polycyclic aromatic hydrocarbons.

PCBs - Polychlorinated biphenyl.

SVOCs - Semivolatile organic compounds.

USEPA - United States Environmental Protection Agency.

UTL - Upper Threshold Value.

NC - Not calculated.

(a) The maximum detected concentration and FOD of the background dataset following removal of outlier values.

(b) Extreme values identified by the default outlier test in ProUCL (version 5.1; USEPA, 2016) was conducted (Dixon's test for under 25 samples).

(c) Extreme values were further evaluated by data transformations (natural log and gamma correction): if the value was identified as an extreme value following the data transformations and additional extren were identified for the sample for the same group of COPCs (e.g., SVOCs), this value was determined to be an outlier and removed from the dataset. If the value was not identified as an extreme value bas on the outlier test results of the transformed datasets and additional extreme values were not identified for the sample for the same group of COPCs, the value is not an outlier and was not removed from the

(d) BTVs were calculated in ProUCL (version 5.1; USEPA, 2016). The 95UTL was selected based on the distribution of the detected concentrations in the dataset.
If the dataset includes non-detects, the non-detects were included at the full value of the detection limit and the BTV was selected from the Kaplan-Meier (KM) statistics.
For gamma UTLs, the Wilson Hilferty (WH) statistic was selected.

(e) The value was not identified as an extreme value based on the outlier test results of the transformed datasets. In addition, extreme values were not identified for other COPCs in the same group (metals) of this sample. Therefore, the value was not removed from the dataset.

ATTACHMENT D TABLE 6
COMPARISON OF CHEMICAL CONCENTRATIONS IN BACKGROUND AND SITE SEDIMENT
TIDAL STREAM NORTH VS OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC (a)	FOD		Distribution		Mean/Median (SD) (mg/kg)		Population Test	p-value	Reject the Null Hypothesis? (c)
	Site	Background	Site	Background	Site (b)	Background (b)			
Off-Project Red Maple Swamp / Tidal Stream Area									
Aluminum	15 / 15	5 / 5	Not Normal	Normal	6020 (6594)	6880 (1136)	WMW	0.5	No
Arsenic	20 / 21	7 / 7	Not Normal	Normal	2.86 (6.612)	2.64 (1.382)	WMW	0.2	No
Barium	21 / 21	7 / 7	Not Normal	Normal	15.6 (29.06)	16.9 (5.994)	WMW	0.4	No
Beryllium	15 / 15	5 / 5	Normal	Normal	0.737 (0.461)	0.508 (0.106)	t-test	0.1	No
Cadmium	16 / 21	5 / 7	Not Normal	Normal	0.181 (0.713)	0.053 (0.0288)	Tarone-Ware	0.014	Yes
Chromium	21 / 21	7 / 7	Not Normal	Normal	8.21 (11.28)	9.3 (2.465)	WMW	0.3	No
Cobalt	15 / 15	5 / 5	Not Normal	Normal	4.06 (8.47)	2.63 (0.418)	WMW	0.2	No
Copper	21 / 21	7 / 7	Not Normal	Normal	0.519 (0.461)	0.56 (0.56)	WMW	0.4	No
Iron	15 / 15	5 / 5	Not Normal	Normal	12200 (34491)	9020 (496.5)	WMW	0.1	No
Lead	21 / 21	7 / 7	Not Normal	Normal	34.4 (130.6)	28.2 (14.21)	WMW	0.1	No
Manganese	15 / 15	5 / 5	Not Normal	Normal	153 (667.7)	106 (20.69)	WMW	0.2	No
Mercury	18 / 21	7 / 7	Not Normal	Normal	0.0425 (0.082)	0.038 (0.0135)	Tarone-Ware	0.4	No
Nickel	15 / 15	5 / 5	Not Normal	Normal	9.17 (8.854)	6.47 (1.247)	WMW	0.2	No
Selenium	16 / 21	6 / 7	Not Normal	Normal	0.593 (1.47)	0.203 (0.179)	Tarone-Ware	0.2	No
Silver	15 / 21	5 / 7	Not Normal	Normal	0.129 (0.221)	0.049 (0.0142)	Tarone-Ware	0.1	No
Thallium	15 / 15	5 / 5	Not Normal	Normal	0.103 (0.117)	0.101 (0.0172)	WMW	0.4	No
Vanadium	15 / 15	5 / 5	Not Normal	Normal	14.7 (20.3)	12.9 (2.069)	WMW	0.3	No
Zinc	15 / 15	5 / 5	Not Normal	Normal	92.4 (96.88)	46.8 (7.651)	WMW	0.022	Yes
SVOCs									
Fluorene	12 / 15	5 / 6	Not Normal	Normal	0.0425 (0.0579)	0.054 (0.0219)	Tarone-Ware	0.6	No

Notes:

COPC - Chemical of Potential Concern.

FOD - Frequency of Detection. The number of detected concentrations: the total number of samples.

HMW - High Molecular Weight.

mg/kg - milligrams per kilogram.

PAH - Polycyclic aromatic hydrocarbons.

SD - Standard deviation.

SVOCs - Semivolatile organic compounds.

WMW - Wilcoxon test.

(a) COPCs retained after comparison of Site maximum detect concentrations to background threshold values in the risk assessment.

(b) The mean (calculated for COPCs for which a t-test was conducted), median (calculated for COPCs for which a Wilcoxon or Tarone-Ware test was conducted) and the standard deviation (in parentheses) of the detected concentrations in Site and background.

(c) The null and alternative hypotheses of the hypothesis test are:

H_o (null): the Site mean concentration is less than or equal to the mean concentration in the background area ($p > 0.05$: fail to reject H_o)

H_a (alternative): The Site mean concentration is greater than the mean concentration in the background area ($p < 0.05$: reject H_o)

ATTACHMENT D TABLE 7
OUTLIER DETERMINATION AND CALCULATION OF BACKGROUND THRESHOLD VALUES FOR COPCS IN
BACKGROUND SEDIMENT - BEACHFRONT
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical	Background FOD (a)	Maximum Detected Concentration (mg/kg) (a)	Extreme Value (mg/kg) (b)	Sample Identification of Extreme Value	Outlier Determination (c)	BTV (mg/kg) (d)	Statistic
Inorganics							
Aluminum	10 / 10	7710	--	--	--	10151	Normal: 95% UTL with 95% Coverage
Arsenic	10 / 10	2.05	--	--	--	2.313	Normal: 95% UTL with 95% Coverage
Cobalt	10 / 10	7.7	7.69 (upper tail)	SED-318	Not outlier (e)	8.45	Normal: 95% UTL with 95% Coverage
Iron	10 / 10	15800	--	--	--	19835	Normal: 95% UTL with 95% Coverage
Manganese	10 / 10	221	--	--	--	255	Normal: 95% UTL with 95% Coverage
Thallium	4 / 10	0.15	--	--	--	0.219	Normal: 95% KM UTL with 95% Coverage

Notes:

BTV - Background Threshold Value.

COPC - Chemical of Potential Concern.

FOD - Frequency of Detection. The number of detected concentrations: the total number of samples.

HMW - High Molecular Weight.

KM - Kaplan Meier.

mg/kg - milligrams per kilogram.

PAH - Polycyclic aromatic hydrocarbons.

SVOCs - Semivolatile organic compounds.

USEPA - United States Environmental Protection Agency.

UTL - Upper Threshold Value.

(a) The maximum detected concentration and FOD of the background dataset following removal of outlier values.

(b) Extreme values identified by the default outlier test in ProUCL (version 5.1; USEPA, 2016) was conducted (Dixon's test for under 25 samples).

(c) Extreme values were further evaluated by data transformations (natural log and gamma correction): if the value was identified as an extreme value following the data transformations and additional extrer were identified for the sample for the same group of COPCs (e.g., SVOCs), this value was determined to be an outlier and removed from the dataset. If the value was not identified as an extreme value bas on the outlier test results of the transformed datasets and additional extreme values were not identified for the sample for the same group of COPCs, the value is not an outlier and was not removed from th

(d) BTVs were calculated in ProUCL (version 5.1; USEPA, 2016). The 95UTL was selected based on the distribution of the detected concentrations in the dataset.

If the dataset includes non-detects, the non-detects were included at the full value of the detection limit and the BTV was selected from the Kaplan-Meier (KM) statistics.

For gamma UTLs, the Wilson Hilferty (WH) statistic was selected.

(e) The value was not identified as an extreme value based on the outlier test results of the transformed datasets. In addition, extreme values were not identified for other COPCs in the same group (metals) of this sample. Therefore, the value was not removed from the dataset.

ATTACHMENT D TABLE 8
COMPARISON OF CHEMICAL CONCENTRATIONS IN BACKGROUND AND SITE SEDIMENT
BEACHFRONT VS OFF-PROJECT NARRAGANSETT BAY / BEACHFRONT AREA
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC (a)	FOD		Distribution		Mean/Median (SD)		Population Test	p-value	Reject the Null Hypothesis? (c)
	Site	Background	Site	Background	Site (b)	Background (b)			
Narragansett Bay and Beach Front Area									
Inorganics									
Aluminum	10 / 10	10 / 10	Not Normal	Normal	2070 (2730)	5135 (1570)	WMW	0.999	No
Arsenic	30 / 30	10 / 10	Not Normal	Normal	1.3 (0.617)	1.495 (0.249)	WMW	0.939	No

Notes:

COPC - Chemical of Potential Concern.

FOD - Frequency of Detection. The number of detected concentrations: the total number of samples.

mg/kg - milligrams per kilogram.

SD - Standard deviation.

WMW - Wilcoxon test.

(a) COPCs retained after comparison of Site maximum detect concentrations to background threshold values in the risk assessment.

(b) The mean (calculated for COPCs for which a t-test was conducted), median (calculated for COPCs for which a Wilcoxon or Tarone-Ware test was conducted) and the standard deviation (in parentheses) of the detected concentrations in Site and background.

(c) The null and alternative hypotheses of the hypothesis test are:

H_o (null): the Site mean concentration is less than or equal to the mean concentration in the background area ($p > 0.05$: fail to reject H_o)

H_a (alternative): The Site mean concentration is greater than the mean concentration in the background area ($p < 0.05$: reject H_o)

ATTACHMENT D TABLE 9
OUTLIER DETERMINATION AND CALCULATION OF BACKGROUND THRESHOLD VALUES FOR COPCS IN BACKGROUND HYDRIC SURFACE SOIL
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical	Background FOD (a)	Maximum Detected Concentration (mg/kg) (a)	Extreme Value (mg/kg) (b)	Sample Identification of Extreme Value	Outlier Determination (c)	BTV (mg/kg) (d)	Statistic
Inorganics							
Aluminum	9 / 9	8510	--	--	--	10992	Normal: 95% UTL with 95% Coverage
Antimony	3 / 10	0.58	--	--	--	NC	--
Arsenic	8 / 8	2.54	9.27	SSH-313	Value removed (e)	3.27	Normal: 95% UTL with 95% Coverage
Chromium	9 / 9	11.5	20.20	SSH-313	Value removed (e)	14.6	Normal: 95% UTL with 95% Coverage
Cobalt	9 / 9	2.7	4.46	SSH-313	Value removed (e)	3.2	Normal: 95% UTL with 95% Coverage
Copper	9 / 9	8.5	40.00	SSH-313	Value removed (e)	10.7	Normal: 95% UTL with 95% Coverage
Iron	9 / 9	11100.0	52000.00	SSH-313	Value removed (e)	13149	Normal: 95% UTL with 95% Coverage
Lead	10 / 10	50.3	--	--	--	59.87	Normal: 95% UTL with 95% Coverage
Manganese	9 / 9	91	176.00	SSH-313	Value removed (e)	105	Normal: 95% UTL with 95% Coverage
Mercury	10 / 10	0.083	0.083	SSH-314	Not outlier (e)	0.094	Normal: 95% UTL with 95% Coverage
Selenium	10 / 10	0.33	--	--	--	0.443	Normal: 95% UTL with 95% Coverage
Thallium	2 / 10	0.15	--	--	--	NC	--
Vanadium	10 / 10	20.1	--	--	--	24.51	Normal: 95% UTL with 95% Coverage
Zinc	10 / 10	37.6	--	--	--	43.23	Normal: 95% UTL with 95% Coverage
SVOCs							
1-Methylnaphthalene	2 / 10	0.0040	--	--	--	NC	--
2-Methylnaphthalene	2 / 10	0.0048	--	--	--	NC	--
Anthracene	9 / 9	0.028	--	--	--	0.0777	Gamma: 95% WH UTL with 95% Coverage
Benzo(a)anthracene	9 / 9	0.23	--	--	--	0.59	Gamma: 95% WH UTL with 95% Coverage
Benzo(a)Pyrene	9 / 9	0.26	--	--	--	0.7	Gamma: 95% WH UTL with 95% Coverage
Benzo(b)fluoranthene	9 / 9	0.95	0.95	SSH-315	Not outlier (g)	1.94	Gamma: 95% WH UTL with 95% Coverage
Benzo(g,h,i)Perylene	9 / 9	0.22	--	--	--	0.56	Gamma: 95% WH UTL with 95% Coverage
Benzo(k)Fluoranthene	9 / 9	0.26	--	--	--	0.546	Gamma: 95% WH UTL with 95% Coverage
Chrysene	10 / 10	0.97	0.97	SSH-315	Not outlier (g)	3.65	Lognormal: 95% UTL 95% Coverage
Dibenzo(a,h)Anthracene	9 / 10	0.054	--	--	--	0.12	Gamma: 95% KM WH UTL with 95% Coverage
Indeno(1,2,3-CD)Pyrene	10 / 10	0.24	--	--	--	1.102	Lognormal: 95% UTL 95% Coverage
Naphthalene	8 / 10	0.016	--	--	--	0.0236	Gamma: 95% KM WH UTL with 95% Coverage
Pyrene	10 / 10	1.40	1.40	SSH-315	Not outlier (g)	2.71	Gamma: 95% WH UTL with 95% Coverage
Total High MW PAHs	10 / 10	6.20	6.20	SSH-315	Not outlier (g)	11.37	Gamma: 95% WH UTL with 95% Coverage
Total PAHs	10 / 10	6.70	6.70	SSH-315	Not outlier (g)	12.38	Gamma: 95% WH UTL with 95% Coverage

ATTACHMENT D TABLE 9
OUTLIER DETERMINATION AND CALCULATION OF BACKGROUND THRESHOLD VALUES FOR COPCS IN BACKGROUND HYDRIC SURFACE SOIL
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical	Background FOD (a)	Maximum Detected Concentration (mg/kg) (a)	Extreme Value (mg/kg) (b)	Sample Identification of Extreme Value	Outlier Determination (c)	BTV (mg/kg) (d)	Statistic

Notes:
BTV - Background Threshold Value.
COPC - Chemical of Potential Concern.
FOD - Frequency of Detection. The number of detected concentrations: the total number of samples.
HMW - High Molecular Weight.
KM - Kaplan Meier.
mg/kg - milligrams per kilogram.
PAH - Polycyclic aromatic hydrocarbons.
SVOCs - Semivolatile organic compounds.
USEPA - United States Environmental Protection Agency.
UTL - Upper Threshold Value.
NC - Not calculated.
(a) The maximum detected concentration and FOD of the background dataset following removal of outlier values.
(b) Extreme values identified by the default outlier test in ProUCL (version 5.1; USEPA, 2016) was conducted (Dixon's test for under 25 samples).
(c) Extreme values were further evaluated by data transformations (natural log and gamma correction): if the value was identified as an extreme value following the data transformations and additional extreme values were identified for the sample for the same group of COPCs (e.g., SVOCs), this value was determined to be an outlier and removed from the dataset. If the value was not identified as an extreme value on the outlier test results of the transformed datasets and additional extreme values were not identified for the sample for the same group of COPCs, the value is not an outlier and was not removed from the dataset.
(d) BTVs were calculated in ProUCL (version 5.1; USEPA, 2016). The 95UTL was selected based on the distribution of the detected concentrations in the dataset.
If the dataset includes non-detects, the non-detects were included at the full value of the detection limit and the BTV was selected from the Kaplan-Meier (KM) statistics.
For gamma UTLs, the Wilson Hilferty (WH) statistic was selected.
(e) The value was identified as an extreme value based on the outlier test results of the transformed datasets. In addition, extreme values were identified other metal COPCs for the same sample. Therefore, the value was removed from the dataset.
(f) The values were not identified as extreme values based on the outlier test results of the transformed datasets. In addition, extreme values were not identified for other metals of this sample. Therefore, the value was not removed from the dataset.
(g) The values were not identified as extreme values based on the outlier test results of the transformed datasets. In addition, extreme values were not identified for other PAHs of this sample. Therefore, the value was not removed from the dataset.

ATTACHMENT D TABLE 10
COMPARISON OF CHEMICAL CONCENTRATIONS IN BACKGROUND AND SITE SURFACE HYDRIC SOIL
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC (a)	FOD		Distribution		Mean/Median (SD) (mg/kg)		Population Test	p-value	Reject the Null Hypothesis? (c)
	Site	Background	Site	Background	Site (b)	Background (b)			
Off-Project Red Maple Swamp / Tidal Stream Area									
Inorganics									
Aluminum	10 / 10	9 / 9	Not Normal	Normal	8805 (4787)	6100 (1508)	WMW	0.028	Yes
Arsenic	16 / 16	8 / 8	Normal	Normal	8.135 (4.338)	1.8 (0.46)	t-test	0	Yes
Chromium	16 / 16	9 / 9	Normal	Normal	19.3 (7.221)	8.7 (1.93)	t-test	0	Yes
Cobalt	10 / 10	9 / 9	Not Normal	Normal	2.735 (2.212)	1.9 (0.41)	WMW	0.006	Yes
Copper	10 / 10	9 / 9	Normal	Normal	23.45 (10.95)	5.89 (1.6)	t-test	0	Yes
Iron	10 / 10	9 / 9	Normal	Normal	13450 (5374)	7384 (1902)	t-test	0.003	Yes
Lead	16 / 16	10 / 10	Normal	Normal	92.46 (70.48)	35.42 (8.399)	t-test	0.003	Yes
Manganese	10 / 10	9 / 9	Not Normal	Normal	89.2 (40.74)	72.8 (10.7)	WMW	0.047	Yes
Mercury	14 / 16	10 / 10	Normal	Normal	0.122 (0.0416)	0.0455 (0.0165)	Tarone-Ware	0.00093934	Yes
Selenium	15 / 16	10 / 10	Not Normal	Normal	0.925 (1.944)	0.23 (0.0714)	WMW	0.000065906	Yes
Thallium	7 / 10	2 / 10	Normal	NC	0.15 (0.07)	0.13 (0.02)	NC	NC	NC
Vanadium	10 / 10	10 / 10	Normal	Normal	34.13 (12.04)	14.56 (3.418)	t-test	0	Yes
Zinc	10 / 10	10 / 10	Normal	Normal	93.06 (81.13)	27.29 (5.476)	t-test	0.015	Yes
SVOCs									
Anthracene	6 / 10	9 / 9	Not Normal	Not Normal	0.0295 (0.149)	0.0064 (0.0106)	Tarone-Ware	0.0501	No
Benzo(a)anthracene	8 / 10	9 / 9	Not Normal	Not Normal	0.22 (1.205)	0.038 (0.0821)	Tarone-Ware	0.0714	No
Benzo(a)Pyrene	10 / 10	9 / 9	Not Normal	Not Normal	0.26 (0.944)	0.047 (0.0968)	WMW	0.0301	Yes
Benzo(b)fluoranthene	10 / 10	9 / 9	Not Normal	Not Normal	0.39 (1.302)	0.069 (0.301)	WMW	0.047	Yes
Benzo(g,h,i)Perylene	9 / 10	9 / 9	Not Normal	Not Normal	0.17 (0.511)	0.036 (0.078)	WMW	0.0554	No
Benzo(k)Fluoranthene	10 / 10	9 / 9	Not Normal	Not Normal	0.086 (0.544)	0.027 (0.0831)	WMW	0.0763	No
Chrysene	8 / 10	10 / 10	Not Normal	Not Normal	0.405 (1.313)	0.046 (0.296)	Tarone-Ware	0.107	No
Dibenzo(a,h)Anthracene	8 / 10	9 / 10	Not Normal	Not Normal	0.052 (0.164)	0.009 (0.0204)	Tarone-Ware	0.0216	Yes
Indeno(1,2,3-CD)Pyrene	9 / 10	10 / 10	Not Normal	Not Normal	0.18 (1.046)	0.03 (0.0793)	WMW	0.0332	Yes
Naphthalene	7 / 10	8 / 10	Not Normal	Not Normal	0.077 (0.171)	0.0063 (0.00493)	Tarone-Ware	0.00118	Yes
Pyrene	10 / 10	10 / 10	Not Normal	Not Normal	0.51 (2.118)	0.114 (0.436)	WMW	0.145	No
Total High MW PAHs	10 / 10	10 / 10	Not Normal	Not Normal	2.45 (11.31)	0.475 (1.907)	WMW	0.0561	No
Total PAHs	10 / 10	10 / 10	Not Normal	Not Normal	3.2 (12.33)	0.56 (2.067)	WMW	0.0268	Yes

ATTACHMENT D TABLE 10
COMPARISON OF CHEMICAL CONCENTRATIONS IN BACKGROUND AND SITE SURFACE HYDRIC SOIL
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC (a)	FOD		Distribution		Mean/Median (SD) (mg/kg)		Population Test	p-value	Reject the Null Hypothesis? (c)
	Site	Background	Site	Background	Site (b)	Background (b)			

Notes:

COPC - Chemical of Potential Concern.

FOD - Frequency of Detection. The number of detected concentrations: the total number of samples.

HMW - High Molecular Weight.

mg/kg - milligrams per kilogram.

NC - Not calculated.

PAH - Polycyclic aromatic hydrocarbons.

SD - Standard deviation.

SVOCs - Semivolatile organic compounds.

WMW - Wilcoxon test.

(a) COPCs retained after comparison of Site maximum detect concentrations to background threshold values in the risk assessment.

(b) The mean (calculated for COPCs for which a t-test was conducted), median (calculated for COPCs for which a Wilcoxon or Tarone-Ware test was conducted) and the standard deviation (in parentheses) of the detected concentrations in Site and background.

(c) The null and alternative hypotheses of the hypothesis test are:

H_o (null): the Site mean concentration is less than or equal to the mean concentration in the background area ($p > 0.05$: fail to reject H_o)

H_a (alternative): The Site mean concentration is greater than the mean concentration in the background area ($p < 0.05$: reject H_o)

ATTACHMENT D TABLE 11
OUTLIER DETERMINATION AND CALCULATION OF BACKGROUND THRESHOLD VALUES FOR COPCS IN BACKGROUND HYDRIC SUBSURFACE SOIL
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical	Background FOD (a)	Maximum Detected Concentration (mg/kg) (a)	Extreme Value (mg/kg) (b)	Sample Identification of Extreme Value	Outlier Determination (c)	BTV (mg/kg) (d)	Statistic
Inorganics							
Aluminum	10 / 10	10800	--	--	--	13619	Normal: 95% UTL with 95% Coverage
Arsenic	9 / 9	3.6	12.5	SSH-313	Value removed (e)	5.67	Gamma: 95% WH UTL with 95% Coverage
Cobalt	9 / 9	2.6	5	SSH-313	Value removed (e)	3.26	Gamma: 95% WH UTL with 95% Coverage
Iron	9 / 9	10700	62900	SSH-313	Value removed (e)	13448	Gamma: 95% WH UTL with 95% Coverage
Thallium	2 / 10	0.13	--	--	--	NC	--
Vanadium	10 / 10	24	--	--	--	29.52	Normal: 95% UTL with 95% Coverage

Notes:

BTV - Background Threshold Value.

COPC - Chemical of Potential Concern.

FOD - Frequency of Detection. The number of detected concentrations: the total number of samples.

HMW - High Molecular Weight.

KM - Kaplan Meier.

mg/kg - milligrams per kilogram.

PAH - Polycyclic aromatic hydrocarbons.

SVOCs - Semivolatile organic compounds.

USEPA - United States Environmental Protection Agency.

UTL - Upper Threshold Value.

NC - Not calculated.

(a) The maximum detected concentration and FOD of the background dataset following removal of outlier values.

(b) Extreme values identified by the default outlier test in ProUCL (version 5.1; USEPA, 2016) was conducted (Dixon's test for under 25 samples).

(c) Extreme values were further evaluated by data transformations (natural log and gamma correction): if the value was identified as an extreme value following the data transformations and additional extreme values were identified for the sample for the same group of COPCs (e.g., SVOCs), this value was determined to be an outlier and removed from the dataset. If the value was not identified as an extreme value b on the outlier test results of the transformed datasets and additional extreme values were not identified for the sample for the same group of COPCs, the value is not an outlier and was not removed from the dataset.

(d) BTVs were calculated in ProUCL (version 5.1; USEPA, 2016). The 95UTL was selected based on the distribution of the detected concentrations in the dataset.
If the dataset includes non-detects, the non-detects were included at the full value of the detection limit and the BTV was selected from the Kaplan-Meier (KM) statistics.
For gamma UTLs, the Wilson Hilferty (WH) statistic was selected.

(e) The value was identified as an extreme value based on the outlier test results of the transformed datasets. In addition, extreme values were identified other metal COPCs for the same sample. Therefore, the value was removed from the dataset.

ATTACHMENT D TABLE 12
COMPARISON OF CHEMICAL CONCENTRATIONS IN BACKGROUND AND SITE HYDRIC SUBSURFACE SEDIMENT
BACKGROUND EVALUATION
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC (a)	FOD		Distribution		Mean/Median (SD) (mg/kg)		Population Test	p-value	Reject the Null Hypothesis? (c)
	Site	Background	Site	Background	Site (b)	Background (b)			
Off-Project Red Maple Swamp / Tidal Stream Area									
Inorganics									
Arsenic	16 / 16	9 / 9	Normal	Not Normal	5.1 (2.838)	1.3 (0.95)	WMW	0.00031	Yes
Cobalt	10 / 10	9 / 9	Normal	Normal	2.69 (1.289)	1.85 (0.41)	t-test	0.04	Yes
Iron	10 / 10	9 / 9	Normal	Not Normal	9201 (4560)	6120 (1939)	WMW	0.047	Yes
Thallium	5 / 10	2 / 10	Normal	NC	0.1 (0.04)	0.13 (0.003)	NC	NC	NC
Vanadium	10 / 10	10 / 10	Normal	Normal	26.96 (11.3)	12.51 (5.842)	t-test	0.001	Yes

Notes:

COPC - Chemical of Potential Concern.

FOD - Frequency of Detection. The number of detected concentrations: the total number of samples.

mg/kg - milligrams per kilogram.

NC - Not calculated.

SD - Standard deviation.

WMW - Wilcoxon test.

(a) COPCs retained after comparison of Site maximum detect concentrations to background threshold values in the risk assessment.

(b) The mean (calculated for COPCs for which a t-test was conducted), median (calculated for COPCs for which a Wilcoxon or Tarone-Ware test was conducted) and the standard deviation (in parentheses) of the detected concentrations in Site and background.

(c) The null and alternative hypotheses of the hypothesis test are:

H_o (null): the Site mean concentration is less than or equal to the mean concentration in the background area ($p > 0.05$: fail to reject H_o)

H_a (alternative): The Site mean concentration is greater than the mean concentration in the background area ($p < 0.05$: reject H_o)

Attachment D-1

ProUCL Output

Background Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.19/22/2020 10:06:30 AM
From File	C:\Users\scesnyc\Desktop\DeskTop Folder\Blue Beach\SOBCK_Input.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

RA_SO_Metals|Aluminum|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Minimum	3540	First Quartile	7235
Second Largest	10700	Median	8525
Maximum	13800	Third Quartile	9663
Mean	8319	SD	2344
Coefficient of Variation	0.282	Skewness	-0.0535
Mean of logged Data	8.983	SD of logged Data	0.319

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.965	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.105	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	13935	90% Percentile (z)	11323
95% UPL (t)	12472	95% Percentile (z)	12174
95% USL	14311	99% Percentile (z)	13772

Gamma GOF Test

A-D Test Statistic	0.568	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.122	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	11.6	k star (bias corrected MLE)	9.892
Theta hat (MLE)	717.2	Theta star (bias corrected MLE)	841
nu hat (MLE)	463.9	nu star (bias corrected)	395.7
MLE Mean (bias corrected)	8319	MLE Sd (bias corrected)	2645

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	13270	90% Percentile	11837

95% Hawkins Wixley (HW) Approx. Gamma UPL	13424	95% Percentile	13092
95% WH Approx. Gamma UTL with 95% Coverage	15520	99% Percentile	15671
95% HW Approx. Gamma UTL with 95% Coverage	15837		
95% WH USL	16137	95% HW USL	16508

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.914	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.146	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	17084	90% Percentile (z)	11978
95% UPL (t)	14003	95% Percentile (z)	13448
95% USL	17981	99% Percentile (z)	16709

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	13800
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	13800	95% BCA Bootstrap UTL with 95% Coverage	13800
95% UPL	13645	90% Percentile	10340
90% Chebyshev UPL	15524	95% Percentile	10855
95% Chebyshev UPL	18788	99% Percentile	13211
95% USL	13800		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Cadmium|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Minimum	0.031	First Quartile	0.0449
Second Largest	0.118	Median	0.056
Maximum	0.142	Third Quartile	0.0718
Mean	0.0651	SD	0.0281
Coefficient of Variation	0.432	Skewness	1.462
Mean of logged Data	-2.807	SD of logged Data	0.385

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.864	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.194	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.132	90% Percentile (z)	0.101
95% UPL (t)	0.115	95% Percentile (z)	0.111
95% USL	0.137	99% Percentile (z)	0.13

Gamma GOF Test

A-D Test Statistic	0.489	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.744	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.138	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	6.831	k star (bias corrected MLE)	5.84
Theta hat (MLE)	0.00953	Theta star (bias corrected MLE)	0.0111
nu hat (MLE)	273.2	nu star (bias corrected)	233.6
MLE Mean (bias corrected)	0.0651	MLE Sd (bias corrected)	0.0269

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.117	90% Percentile	0.101
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.117	95% Percentile	0.115
95% WH Approx. Gamma UTL with 95% Coverage	0.142	99% Percentile	0.143
95% HW Approx. Gamma UTL with 95% Coverage	0.144		
95% WH USL	0.149	95% HW USL	0.151

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.965	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.116	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.152	90% Percentile (z)	0.0989
95% UPL (t)	0.119	95% Percentile (z)	0.114
95% USL	0.162	99% Percentile (z)	0.148

Nonparametric Distribution Free Background Statistics
Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	0.142
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified C	59
95% Percentile Bootstrap UTL with 95% Coverage	0.142	95% BCA Bootstrap UTL with 95% Coverage	0.142

95% UPL	0.141	90% Percentile	0.103
90% Chebyshev UPL	0.151	95% Percentile	0.119
95% Chebyshev UPL	0.191	99% Percentile	0.137
95% USL	0.142		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Chromium|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	19
Minimum	2.62	First Quartile	8.128
Second Largest	11.7	Median	9.58
Maximum	11.8	Third Quartile	10.28
Mean	8.796	SD	2.696
Coefficient of Variation	0.306	Skewness	-1.395
Mean of logged Data	2.103	SD of logged Data	0.439

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.822	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.23	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	15.25	90% Percentile (z)	12.25
95% UPL (t)	13.57	95% Percentile (z)	13.23
95% USL	15.69	99% Percentile (z)	15.07

Gamma GOF Test

A-D Test Statistic	2.18	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.744	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.274	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	7.152	k star (bias corrected MLE)	6.113
Theta hat (MLE)	1.23	Theta star (bias corrected MLE)	1.439
nu hat (MLE)	286.1	nu star (bias corrected)	244.5
MLE Mean (bias corrected)	8.796	MLE Sd (bias corrected)	3.558

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	15.63	90% Percentile	13.55
95% Hawkins Wixley (HW) Approx. Gamma UPL	16.07	95% Percentile	15.34
95% WH Approx. Gamma UTL with 95% Coverage	18.92	99% Percentile	19.1
95% HW Approx. Gamma UTL with 95% Coverage	19.75		
95% WH USL	19.83	95% HW USL	20.8

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.701	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.289	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	23.46	90% Percentile (z)	14.38
95% UPL (t)	17.83	95% Percentile (z)	16.87
95% USL	25.17	99% Percentile (z)	22.75

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	11.8
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	11.8	95% BCA Bootstrap UTL with 95% Coverage	11.8
95% UPL	11.8	90% Percentile	11.43
90% Chebyshev UPL	17.08	95% Percentile	11.71
95% Chebyshev UPL	20.84	99% Percentile	11.78
95% USL	11.8		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Cobalt|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Minimum	1.63	First Quartile	2.758
Second Largest	4.82	Median	3.08
Maximum	6.32	Third Quartile	3.608
Mean	3.287	SD	1.071
Coefficient of Variation	0.326	Skewness	1.145
Mean of logged Data	1.143	SD of logged Data	0.315

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.921	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.164	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	5.854	90% Percentile (z)	4.66
95% UPL (t)	5.185	95% Percentile (z)	5.049
95% USL	6.026	99% Percentile (z)	5.779

Gamma GOF Test

A-D Test Statistic	0.334	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.136	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	10.7	k star (bias corrected MLE)	9.131
Theta hat (MLE)	0.307	Theta star (bias corrected MLE)	0.36
nu hat (MLE)	428.1	nu star (bias corrected)	365.2
MLE Mean (bias corrected)	3.287	MLE Sd (bias corrected)	1.088

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	5.327	90% Percentile	4.735
95% Hawkins Wixley (HW) Approx. Gamma UPL	5.359	95% Percentile	5.256
95% WH Approx. Gamma UTL with 95% Coverage	6.265	99% Percentile	6.33
95% HW Approx. Gamma UTL with 95% Coverage	6.349		
95% WH USL	6.523	95% HW USL	6.624

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.974	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.151	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	6.675	90% Percentile (z)	4.697
95% UPL (t)	5.482	95% Percentile (z)	5.267
95% USL	7.022	99% Percentile (z)	6.53

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	6.32
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59

95% Percentile Bootstrap UTL with 95% Coverage	6.32	95% BCA Bootstrap UTL with 95% Coverage	6.32
95% UPL	6.245	90% Percentile	4.487
90% Chebyshev UPL	6.58	95% Percentile	4.895
95% Chebyshev UPL	8.071	99% Percentile	6.035
95% USL	6.32		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Copper|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Minimum	3.39	First Quartile	5.283
Second Largest	14.2	Median	7.455
Maximum	17.3	Third Quartile	9.528
Mean	8.033	SD	3.749
Coefficient of Variation	0.467	Skewness	1.034
Mean of logged Data	1.986	SD of logged Data	0.451

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.912	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.141	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	17.02	90% Percentile (z)	12.84
95% UPL (t)	14.68	95% Percentile (z)	14.2
95% USL	17.62	99% Percentile (z)	16.75

Gamma GOF Test

A-D Test Statistic	0.249	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0963	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.296	k star (bias corrected MLE)	4.535
Theta hat (MLE)	1.517	Theta star (bias corrected MLE)	1.771
nu hat (MLE)	211.8	nu star (bias corrected)	181.4
MLE Mean (bias corrected)	8.033	MLE Sd (bias corrected)	3.772

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	15.39	90% Percentile	13.09
95% Hawkins Wixley (HW) Approx. Gamma UPL	15.55	95% Percentile	15.07
95% WH Approx. Gamma UTL with 95% Coverage	19.11	99% Percentile	19.28
95% HW Approx. Gamma UTL with 95% Coverage	19.57		
95% WH USL	20.15	95% HW USL	20.71

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.977	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0809	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	21.48	90% Percentile (z)	12.99
95% UPL (t)	16.21	95% Percentile (z)	15.31
95% USL	23.1	99% Percentile (z)	20.82

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	17.3
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	17.3	95% BCA Bootstrap UTL with 95% Coverage	17.3
95% UPL	17.15	90% Percentile	14.02
90% Chebyshev UPL	19.56	95% Percentile	14.36
95% Chebyshev UPL	24.78	99% Percentile	16.71
95% USL	17.3		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Iron|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	18
Minimum	6020	First Quartile	10850
Second Largest	15900	Median	12050
Maximum	17600	Third Quartile	12950
Mean	11825	SD	2693
Coefficient of Variation	0.228	Skewness	-0.115
Mean of logged Data	9.351	SD of logged Data	0.248

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test			
Shapiro Wilk Test Statistic	0.973	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.138	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	18278	90% Percentile (z)	15276
95% UPL (t)	16597	95% Percentile (z)	16255
95% USL	18711	99% Percentile (z)	18091

Gamma GOF Test			
A-D Test Statistic	0.482	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.166	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	18.43	k star (bias corrected MLE)	15.7
Theta hat (MLE)	641.7	Theta star (bias corrected MLE)	753.3
nu hat (MLE)	737.1	nu star (bias corrected)	627.9
MLE Mean (bias corrected)	11825	MLE Sd (bias corrected)	2985

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	17296	90% Percentile	15774
95% Hawkins Wixley (HW) Approx. Gamma UPL	17421	95% Percentile	17123
95% WH Approx. Gamma UTL with 95% Coverage	19669	99% Percentile	19850
95% HW Approx. Gamma UTL with 95% Coverage	19924		
95% WH USL	20313	95% HW USL	20610

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.932	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.185	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	20867	90% Percentile (z)	15819
95% UPL (t)	17869	95% Percentile (z)	17314
95% USL	21716	99% Percentile (z)	20509

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	20	95% UTL with 95% Coverage	17600
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642

		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	17600	95% BCA Bootstrap UTL with 95% Coverage	17600
95% UPL	17515	90% Percentile	14460
90% Chebyshev UPL	20105	95% Percentile	15985
95% Chebyshev UPL	23855	99% Percentile	17277
95% USL	17600		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Lead|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	18
Minimum	6.44	First Quartile	11.88
Second Largest	25.9	Median	19.8
Maximum	34.2	Third Quartile	22.28
Mean	17.68	SD	7.228
Coefficient of Variation	0.409	Skewness	0.193
Mean of logged Data	2.779	SD of logged Data	0.468

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.952	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.147	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	35	90% Percentile (z)	26.94
95% UPL (t)	30.48	95% Percentile (z)	29.57
95% USL	36.16	99% Percentile (z)	34.49

Gamma GOF Test

A-D Test Statistic	0.575	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.186	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.509	k star (bias corrected MLE)	4.716
Theta hat (MLE)	3.209	Theta star (bias corrected MLE)	3.748
nu hat (MLE)	220.3	nu star (bias corrected)	188.6
MLE Mean (bias corrected)	17.68	MLE Sd (bias corrected)	8.14

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	33.57	90% Percentile	28.58
95% Hawkins Wixley (HW) Approx. Gamma UPL	34.23	95% Percentile	32.84
95% WH Approx. Gamma UTL with 95% Coverage	41.53	99% Percentile	41.86
95% HW Approx. Gamma UTL with 95% Coverage	43		
95% WH USL	43.76	95% HW USL	45.51

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.918	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.197	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data Not Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	49.37	90% Percentile (z)	29.32
95% UPL (t)	36.87	95% Percentile (z)	34.75
95% USL	53.23	99% Percentile (z)	47.79

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	34.2
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	34.2	95% BCA Bootstrap UTL with 95% Coverage	34.2
95% UPL	33.79	90% Percentile	24.46
90% Chebyshev UPL	39.9	95% Percentile	26.32
95% Chebyshev UPL	49.96	99% Percentile	32.62
95% USL	34.2		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Manganese|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	19
Minimum	85.9	First Quartile	104.5
Second Largest	196	Median	128.5
Maximum	207	Third Quartile	153.8
Mean	133.5	SD	35.76
Coefficient of Variation	0.268	Skewness	0.634
Mean of logged Data	4.861	SD of logged Data	0.261

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.937	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.126	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	219.2	90% Percentile (z)	179.3
95% UPL (t)	196.9	95% Percentile (z)	192.3
95% USL	224.9	99% Percentile (z)	216.7

Gamma GOF Test

A-D Test Statistic	0.303	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.104	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	15.38	k star (bias corrected MLE)	13.1
Theta hat (MLE)	8.683	Theta star (bias corrected MLE)	10.19
nu hat (MLE)	615	nu star (bias corrected)	524.1
MLE Mean (bias corrected)	133.5	MLE Sd (bias corrected)	36.88

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	201.6	90% Percentile	182.4
95% Hawkins Wixley (HW) Approx. Gamma UPL	202.4	95% Percentile	199.4
95% WH Approx. Gamma UTL with 95% Coverage	231.7	99% Percentile	233.9
95% HW Approx. Gamma UTL with 95% Coverage	233.9		
95% WH USL	239.9	95% HW USL	242.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.963	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0884	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	241.6	90% Percentile (z)	180.6
95% UPL (t)	205.3	95% Percentile (z)	198.6
95% USL	252	99% Percentile (z)	237.2

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	207

Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	207	95% BCA Bootstrap UTL with 95% Coverage	207
95% UPL	206.5	90% Percentile	182.5
90% Chebyshev UPL	243.5	95% Percentile	196.6
95% Chebyshev UPL	293.3	99% Percentile	204.9
95% USL	207		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Nickel|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Minimum	2.15	First Quartile	5.875
Second Largest	8.67	Median	6.275
Maximum	10.7	Third Quartile	7.518
Mean	6.397	SD	1.968
Coefficient of Variation	0.308	Skewness	-0.162
Mean of logged Data	1.8	SD of logged Data	0.368

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.959	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.174	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	11.11	90% Percentile (z)	8.918
95% UPL (t)	9.883	95% Percentile (z)	9.633
95% USL	11.43	99% Percentile (z)	10.97

Gamma GOF Test

A-D Test Statistic	0.777	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.742	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.222	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	9.135	k star (bias corrected MLE)	7.798
Theta hat (MLE)	0.7	Theta star (bias corrected MLE)	0.82
nu hat (MLE)	365.4	nu star (bias corrected)	311.9

MLE Mean (bias corrected)	6.397	MLE Sd (bias corrected)	2.291

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	10.74	90% Percentile	9.451
95% Hawkins Wixley (HW) Approx. Gamma UPL	10.91	95% Percentile	10.57
95% WH Approx. Gamma UTL with 95% Coverage	12.76	99% Percentile	12.89
95% HW Approx. Gamma UTL with 95% Coverage	13.12		
95% WH USL	13.32	95% HW USL	13.74

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.876	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.245	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	14.6	90% Percentile (z)	9.693
95% UPL (t)	11.61	95% Percentile (z)	11.08
95% USL	15.49	99% Percentile (z)	14.24

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	10.7
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	10.7	95% BCA Bootstrap UTL with 95% Coverage	10.7
95% UPL	10.6	90% Percentile	8.472
90% Chebyshev UPL	12.44	95% Percentile	8.772
95% Chebyshev UPL	15.18	99% Percentile	10.31
95% USL	10.7		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Silver|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	18
Minimum	0.014	First Quartile	0.0323
Second Largest	0.136	Median	0.061
Maximum	0.194	Third Quartile	0.0869
Mean	0.0681	SD	0.0473
Coefficient of Variation	0.695	Skewness	1.131
Mean of logged Data	-2.929	SD of logged Data	0.744

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.902	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.144	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.181	90% Percentile (z)	0.129
95% UPL (t)	0.152	95% Percentile (z)	0.146
95% USL	0.189	99% Percentile (z)	0.178

Gamma GOF Test

A-D Test Statistic	0.217	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.751	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.122	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.196	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.218	k star (bias corrected MLE)	1.919
Theta hat (MLE)	0.0307	Theta star (bias corrected MLE)	0.0355
nu hat (MLE)	88.72	nu star (bias corrected)	76.75
MLE Mean (bias corrected)	0.0681	MLE Sd (bias corrected)	0.0491

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.17	90% Percentile	0.134
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.175	95% Percentile	0.164
95% WH Approx. Gamma UTL with 95% Coverage	0.229	99% Percentile	0.23
95% HW Approx. Gamma UTL with 95% Coverage	0.243		
95% WH USL	0.247	95% HW USL	0.264

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.967	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.112	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.318	90% Percentile (z)	0.139
95% UPL (t)	0.2	95% Percentile (z)	0.182
95% USL	0.358	99% Percentile (z)	0.302

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	0.194
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	0.194	95% BCA Bootstrap UTL with 95% Coverage	0.194
95% UPL	0.191	90% Percentile	0.135
90% Chebyshev UPL	0.214	95% Percentile	0.139
95% Chebyshev UPL	0.279	99% Percentile	0.183
95% USL	0.194		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Thallium|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Minimum	0.057	First Quartile	0.0925
Second Largest	0.165	Median	0.101
Maximum	0.181	Third Quartile	0.116
Mean	0.108	SD	0.0292
Coefficient of Variation	0.271	Skewness	0.998
Mean of logged Data	-2.261	SD of logged Data	0.263

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.916	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.163	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.178	90% Percentile (z)	0.145
95% UPL (t)	0.159	95% Percentile (z)	0.156
95% USL	0.182	99% Percentile (z)	0.176

Gamma GOF Test

A-D Test Statistic	0.498	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.138	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	15.32	k star (bias corrected MLE)	13.05
Theta hat (MLE)	0.00703	Theta star (bias corrected MLE)	0.00826

nu hat (MLE)	612.7	nu star (bias corrected)	522.2
MLE Mean (bias corrected)	0.108	MLE Sd (bias corrected)	0.0298

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.163	90% Percentile	0.147
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.163	95% Percentile	0.161
95% WH Approx. Gamma UTL with 95% Coverage	0.187	99% Percentile	0.189
95% HW Approx. Gamma UTL with 95% Coverage	0.189		
95% WH USL	0.194	95% HW USL	0.196

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.957	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.148	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.196	90% Percentile (z)	0.146
95% UPL (t)	0.166	95% Percentile (z)	0.161
95% USL	0.204	99% Percentile (z)	0.192

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	0.181
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	0.181	95% BCA Bootstrap UTL with 95% Coverage	0.181
95% UPL	0.18	90% Percentile	0.146
90% Chebyshev UPL	0.197	95% Percentile	0.166
95% Chebyshev UPL	0.238	99% Percentile	0.178
95% USL	0.181		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Vanadium|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	19
Minimum	3.99	First Quartile	12.35
Second Largest	18.1	Median	14.5
Maximum	19.6	Third Quartile	15.68
Mean	13.42	SD	4.205
Coefficient of Variation	0.313	Skewness	-1.069
Mean of logged Data	2.526	SD of logged Data	0.431

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557
Normal GOF Test			
Shapiro Wilk Test Statistic	0.892	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.182	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	23.5	90% Percentile (z)	18.81
95% UPL (t)	20.87	95% Percentile (z)	20.34
95% USL	24.17	99% Percentile (z)	23.2
Gamma GOF Test			
A-D Test Statistic	1.583	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.744	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.248	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	7.253	k star (bias corrected MLE)	6.199
Theta hat (MLE)	1.85	Theta star (bias corrected MLE)	2.165
nu hat (MLE)	290.1	nu star (bias corrected)	247.9
MLE Mean (bias corrected)	13.42	MLE Sd (bias corrected)	5.391
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	23.77	90% Percentile	20.63
95% Hawkins Wixley (HW) Approx. Gamma UPL	24.38	95% Percentile	23.34
95% WH Approx. Gamma UTL with 95% Coverage	28.74	99% Percentile	29.02
95% HW Approx. Gamma UTL with 95% Coverage	29.93		
95% WH USL	30.12	95% HW USL	31.5
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.761	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.281	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	35.17	90% Percentile (z)	21.74
95% UPL (t)	26.87	95% Percentile (z)	25.43
95% USL	37.69	99% Percentile (z)	34.13
Nonparametric Distribution Free Background Statistics			
Data appear Approximate Normal at 5% Significance Level			

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	19.6
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	19.6	95% BCA Bootstrap UTL with 95% Coverage	19.6
95% UPL	19.53	90% Percentile	17.47
90% Chebyshev UPL	26.35	95% Percentile	18.18
95% Chebyshev UPL	32.2	99% Percentile	19.32
95% USL	19.6		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Zinc|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Minimum	17.5	First Quartile	25.13
Second Largest	45	Median	29.65
Maximum	51.4	Third Quartile	32.18
Mean	29.79	SD	8.49
Coefficient of Variation	0.285	Skewness	0.918
Mean of logged Data	3.357	SD of logged Data	0.277

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.932	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.17	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	50.13	90% Percentile (z)	40.67
95% UPL (t)	44.83	95% Percentile (z)	43.75
95% USL	51.49	99% Percentile (z)	49.54

Gamma GOF Test

A-D Test Statistic	0.324	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.133	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	13.79	k star (bias corrected MLE)	11.75

Theta hat (MLE)	2.16	Theta star (bias corrected MLE)	2.534
nu hat (MLE)	551.6	nu star (bias corrected)	470.2
MLE Mean (bias corrected)	29.79	MLE Sd (bias corrected)	8.689

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	45.91	90% Percentile	41.33
95% Hawkins Wixley (HW) Approx. Gamma UPL	46.11	95% Percentile	45.37
95% WH Approx. Gamma UTL with 95% Coverage	53.11	99% Percentile	53.63
95% HW Approx. Gamma UTL with 95% Coverage	53.66		
95% WH USL	55.07	95% HW USL	55.74

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.971	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.12	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	55.71	90% Percentile (z)	40.93
95% UPL (t)	46.88	95% Percentile (z)	45.26
95% USL	58.24	99% Percentile (z)	54.65

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	51.4
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	51.4	95% BCA Bootstrap UTL with 95% Coverage	51.4
95% UPL	51.08	90% Percentile	40.23
90% Chebyshev UPL	55.89	95% Percentile	45.32
95% Chebyshev UPL	67.71	99% Percentile	50.18
95% USL	51.4		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.19/24/2020 2:48:42 PM
From File	C:\Users\scesnyc\Desktop\DeskTop Folder\Blue Beach\Input\SOBCK_Input.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

RA_SO_Metals|Arsenic|mg/kg

General Statistics			
Total Number of Observations	20	Number of Distinct Observations	18
Minimum	0.86	First Quartile	2.33
Second Largest	3.56	Median	2.565
Maximum	5.97	Third Quartile	2.828
Mean	2.607	SD	1.055
Coefficient of Variation	0.405	Skewness	1.359
Mean of logged Data	0.877	SD of logged Data	0.431
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557
Normal GOF Test			
Shapiro Wilk Test Statistic	0.826	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.23	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	5.133	90% Percentile (z)	3.958
95% UPL (t)	4.475	95% Percentile (z)	4.341
95% USL	5.302	99% Percentile (z)	5.06
Gamma GOF Test			
A-D Test Statistic	1.349	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.744	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.23	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	6.37	k star (bias corrected MLE)	5.448
Theta hat (MLE)	0.409	Theta star (bias corrected MLE)	0.478
nu hat (MLE)	254.8	nu star (bias corrected)	217.9
MLE Mean (bias corrected)	2.607	MLE Sd (bias corrected)	1.117
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	4.759	90% Percentile	4.101
95% Hawkins Wixley (HW) Approx. Gamma UPL	4.836	95% Percentile	4.673
95% WH Approx. Gamma UTL with 95% Coverage	5.814	99% Percentile	5.877
95% HW Approx. Gamma UTL with 95% Coverage	5.987		
95% WH USL	6.109	95% HW USL	6.314
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.848	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.259	Lilliefors Lognormal GOF Test	

5% Lilliefors Critical Value	0.192	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	6.758	90% Percentile (z)	4.179
95% UPL (t)	5.163	95% Percentile (z)	4.888
95% USL	7.242	99% Percentile (z)	6.558

Nonparametric Distribution Free Background Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	5.97
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	5.97	95% BCA Bootstrap UTL with 95% Coverage	5.97
95% UPL	5.85	90% Percentile	3.416
90% Chebyshev UPL	5.848	95% Percentile	3.681
95% Chebyshev UPL	7.317	99% Percentile	5.512
95% USL	5.97		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_SVOCs_EPHs|Benzo(a)anthracene|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Minimum	0.0031	First Quartile	0.00753
Second Largest	0.095	Median	0.0203
Maximum	0.26	Third Quartile	0.0713
Mean	0.0441	SD	0.0599
Coefficient of Variation	1.356	Skewness	2.7
Mean of logged Data	-3.843	SD of logged Data	1.263

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.671	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.246	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.188	90% Percentile (z)	0.121

95% UPL (t)	0.15	95% Percentile (z)	0.143
95% USL	0.197	99% Percentile (z)	0.183

Gamma GOF Test

A-D Test Statistic	0.561	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.776	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.158	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.201	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.819	k star (bias corrected MLE)	0.729
Theta hat (MLE)	0.0539	Theta star (bias corrected MLE)	0.0605
nu hat (MLE)	32.75	nu star (bias corrected)	29.17
MLE Mean (bias corrected)	0.0441	MLE Sd (bias corrected)	0.0517

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.152	90% Percentile	0.11
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.158	95% Percentile	0.148
95% WH Approx. Gamma UTL with 95% Coverage	0.234	99% Percentile	0.239
95% HW Approx. Gamma UTL with 95% Coverage	0.256		
95% WH USL	0.258	95% HW USL	0.288

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.129	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.442	90% Percentile (z)	0.108
95% UPL (t)	0.201	95% Percentile (z)	0.171
95% USL	0.541	99% Percentile (z)	0.404

Nonparametric Distribution Free Background Statistics

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	0.26
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified C	59
95% Percentile Bootstrap UTL with 95% Coverage	0.26	95% BCA Bootstrap UTL with 95% Coverage	0.26
95% UPL	0.252	90% Percentile	0.0914
90% Chebyshev UPL	0.228	95% Percentile	0.103
95% Chebyshev UPL	0.312	99% Percentile	0.229
95% USL	0.26		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_SVOCs_EPHs|Benzo(g,h,i)Perylene|mg/kg

General Statistics			
Total Number of Observations	20	Number of Distinct Observations	18
Minimum	0.0036	First Quartile	0.00785
Second Largest	0.07	Median	0.0163
Maximum	0.19	Third Quartile	0.0415
Mean	0.0327	SD	0.0426
Coefficient of Variation	1.302	Skewness	2.903
Mean of logged Data	-4	SD of logged Data	1.093

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test			
Shapiro Wilk Test Statistic	0.657	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.247	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	0.135	90% Percentile (z)	0.0873
95% UPL (t)	0.108	95% Percentile (z)	0.103
95% USL	0.142	99% Percentile (z)	0.132

Gamma GOF Test			
A-D Test Statistic	0.521	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.768	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.164	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.199	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	0.996	k star (bias corrected MLE)	0.88
Theta hat (MLE)	0.0328	Theta star (bias corrected MLE)	0.0372
nu hat (MLE)	39.84	nu star (bias corrected)	35.2
MLE Mean (bias corrected)	0.0327	MLE Sd (bias corrected)	0.0349

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	0.105	90% Percentile	0.0777
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.108	95% Percentile	0.103
95% WH Approx. Gamma UTL with 95% Coverage	0.157	99% Percentile	0.161
95% HW Approx. Gamma UTL with 95% Coverage	0.169		
95% WH USL	0.173	95% HW USL	0.188

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.965	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.13	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.251	90% Percentile (z)	0.0743
95% UPL (t)	0.127	95% Percentile (z)	0.111
95% USL	0.299	99% Percentile (z)	0.233

Nonparametric Distribution Free Background Statistics
Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	0.19
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	0.19	95% BCA Bootstrap UTL with 95% Coverage	0.19
95% UPL	0.184	90% Percentile	0.0673
90% Chebyshev UPL	0.164	95% Percentile	0.076
95% Chebyshev UPL	0.223	99% Percentile	0.167
95% USL	0.19		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_SVOCs_EPHs|Indeno(1,2,3-CD)Pyrene|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	19
Minimum	0.0029	First Quartile	0.00608
Second Largest	0.062	Median	0.0148
Maximum	0.16	Third Quartile	0.034
Mean	0.0273	SD	0.036
Coefficient of Variation	1.317	Skewness	2.907
Mean of logged Data	-4.188	SD of logged Data	1.095

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.655	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.249	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.113	90% Percentile (z)	0.0734
95% UPL (t)	0.091	95% Percentile (z)	0.0865
95% USL	0.119	99% Percentile (z)	0.111

Gamma GOF Test

A-D Test Statistic	0.519	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.769	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.14	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.199	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.985	k star (bias corrected MLE)	0.871
Theta hat (MLE)	0.0277	Theta star (bias corrected MLE)	0.0314
nu hat (MLE)	39.4	nu star (bias corrected)	34.82
MLE Mean (bias corrected)	0.0273	MLE Sd (bias corrected)	0.0293

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0882	90% Percentile	0.065
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0903	95% Percentile	0.0859
95% WH Approx. Gamma UTL with 95% Coverage	0.132	99% Percentile	0.135
95% HW Approx. Gamma UTL with 95% Coverage	0.141		
95% WH USL	0.145	95% HW USL	0.157

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.966	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.103	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.209	90% Percentile (z)	0.0618
95% UPL (t)	0.106	95% Percentile (z)	0.092
95% USL	0.25	99% Percentile (z)	0.194

Nonparametric Distribution Free Background Statistics

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	0.16
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified C	59
95% Percentile Bootstrap UTL with 95% Coverage	0.16	95% BCA Bootstrap UTL with 95% Coverage	0.16
95% UPL	0.155	90% Percentile	0.0566
90% Chebyshev UPL	0.138	95% Percentile	0.0669
95% Chebyshev UPL	0.188	99% Percentile	0.141
95% USL	0.16		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.

Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Selenium|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	18
Minimum	0.059	First Quartile	0.155
Second Largest	0.43	Median	0.23
Maximum	0.44	Third Quartile	0.321
Mean	0.243	SD	0.113
Coefficient of Variation	0.466	Skewness	0.138
Mean of logged Data	-1.548	SD of logged Data	0.572

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.971	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0947	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.514	90% Percentile (z)	0.388
95% UPL (t)	0.443	95% Percentile (z)	0.429
95% USL	0.532	99% Percentile (z)	0.506

Gamma GOF Test

A-D Test Statistic	0.274	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.746	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0848	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.195	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.954	k star (bias corrected MLE)	3.394
Theta hat (MLE)	0.0614	Theta star (bias corrected MLE)	0.0715
nu hat (MLE)	158.2	nu star (bias corrected)	135.8
MLE Mean (bias corrected)	0.243	MLE Sd (bias corrected)	0.132

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.505	90% Percentile	0.419
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.52	95% Percentile	0.492
95% WH Approx. Gamma UTL with 95% Coverage	0.644	99% Percentile	0.648
95% HW Approx. Gamma UTL with 95% Coverage	0.677		
95% WH USL	0.683	95% HW USL	0.722

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.918	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.122	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	0.838	90% Percentile (z)	0.443
95% UPL (t)	0.586	95% Percentile (z)	0.545
95% USL	0.918	99% Percentile (z)	0.805

Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	20	95% UTL with 95% Coverage	0.44
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
		Approximate Sample Size needed to achieve specified (	59
95% Percentile Bootstrap UTL with 95% Coverage	0.44	95% BCA Bootstrap UTL with 95% Coverage	0.44
95% UPL	0.44	90% Percentile	0.393
90% Chebyshev UPL	0.591	95% Percentile	0.431
95% Chebyshev UPL	0.748	99% Percentile	0.438
95% USL	0.44		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/24/2020 2:52:39 PM
From File	SOBCK_Input.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

RA_SO_Metals|Antimony|mg/kg

General Statistics

Total Number of Observations	20	Number of Missing Observations	0
Number of Distinct Observations	16		
Number of Detects	19	Number of Non-Detects	1
Number of Distinct Detects	15	Number of Distinct Non-Detects	1
Minimum Detect	0.019	Minimum Non-Detect	0.037
Maximum Detect	0.14	Maximum Non-Detect	0.037
Variance Detected	6.2448E-4	Percent Non-Detects	5%
Mean Detected	0.0548	SD Detected	0.025
Mean of Detected Logged Data	-2.991	SD of Detected Logged Data	0.438

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.777	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.901	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.237	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.197	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.053	KM SD	0.025
95% UTL95% Coverage	0.113	95% KM UPL (t)	0.0972
90% KM Percentile (z)	0.085	95% KM Percentile (z)	0.0941
99% KM Percentile (z)	0.111	95% KM USL	0.117

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.053	SD	0.0256
95% UTL95% Coverage	0.114	95% UPL (t)	0.0984
90% Percentile (z)	0.0859	95% Percentile (z)	0.0952
99% Percentile (z)	0.113	95% USL	0.119

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.999	Anderson-Darling GOF Test	
5% A-D Critical Value	0.742	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.182	Kolmogorov-Smirnov GOF	

5% K-S Critical Value	0.199	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	5.87	k star (bias corrected MLE)	4.978
Theta hat (MLE)	0.00934	Theta star (bias corrected MLE)	0.011
nu hat (MLE)	223	nu star (bias corrected)	189.2
MLE Mean (bias corrected)	0.0548		
MLE Sd (bias corrected)	0.0246	95% Percentile of Chisquare (2kstar)	18.25

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.019	Mean	0.0532
Maximum	0.14	Median	0.0503
SD	0.0254	CV	0.478
k hat (MLE)	5.224	k star (bias corrected MLE)	4.474
Theta hat (MLE)	0.0102	Theta star (bias corrected MLE)	0.0119
nu hat (MLE)	209	nu star (bias corrected)	179
MLE Mean (bias corrected)	0.0532	MLE Sd (bias corrected)	0.0251
95% Percentile of Chisquare (2kstar)	16.85	90% Percentile	0.0868
95% Percentile	0.1	99% Percentile	0.128

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.127	0.13	95% Approx. Gamma UPL	0.102	0.103
95% Gamma USL	0.134	0.138			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.053	SD (KM)	0.025
Variance (KM)	6.2296E-4	SE of Mean (KM)	0.00573
k hat (KM)	4.513	k star (KM)	3.87
nu hat (KM)	180.5	nu star (KM)	154.8
theta hat (KM)	0.0117	theta star (KM)	0.0137
80% gamma percentile (KM)	0.0734	90% gamma percentile (KM)	0.0892
95% gamma percentile (KM)	0.104	99% gamma percentile (KM)	0.135

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.126	0.129	95% Approx. Gamma UPL	0.101	0.103
95% KM Gamma Percentile	0.0967	0.0978	95% Gamma USL	0.133	0.137

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.868	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.197	Lilliefors GOF Test
5% Lilliefors Critical Value	0.197	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0533	Mean in Log Scale	-3.027
SD in Original Scale	0.0252	SD in Log Scale	0.454
95% UTL95% Coverage	0.144	95% BCA UTL95% Coverage	0.14
95% Bootstrap (%) UTL95% Coverage	0.14	95% UPL (t)	0.108
90% Percentile (z)	0.0868	95% Percentile (z)	0.102
99% Percentile (z)	0.14	95% USL	0.155

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-3.04	95% KM UTL (Lognormal)95% Coverage	0.146
KM SD of Logged Data	0.466	95% KM UPL (Lognormal)	0.109
95% KM Percentile Lognormal (z)	0.103	95% KM USL (Lognormal)	0.158

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.053	Mean in Log Scale	-3.041
SD in Original Scale	0.0256	SD in Log Scale	0.481
95% UTL95% Coverage	0.151	95% UPL (t)	0.112
90% Percentile (z)	0.0885	95% Percentile (z)	0.105
99% Percentile (z)	0.146	95% USL	0.164

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	20	95% UTL with95% Coverage	0.14
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.137
95% USL	0.14	95% KM Chebyshev UPL	0.165

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Mercury|mg/kg

General Statistics

Total Number of Observations	20	Number of Missing Observations	0
Number of Distinct Observations	17		
Number of Detects	17	Number of Non-Detects	3
Number of Distinct Detects	14	Number of Distinct Non-Detects	3
Minimum Detect	0.0072	Minimum Non-Detect	0.014
Maximum Detect	0.0542	Maximum Non-Detect	0.018
Variance Detected	1.1243E-4	Percent Non-Detects	15%
Mean Detected	0.0311	SD Detected	0.0106
Mean of Detected Logged Data	-3.544	SD of Detected Logged Data	0.435

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.93	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.892	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.17	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.207	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0275	KM SD	0.0127
95% UTL95% Coverage	0.058	95% KM UPL (t)	0.0501
90% KM Percentile (z)	0.0438	95% KM Percentile (z)	0.0484
99% KM Percentile (z)	0.0571	95% KM USL	0.0601

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0276	SD	0.0128
95% UTL95% Coverage	0.0584	95% UPL (t)	0.0504
90% Percentile (z)	0.0441	95% Percentile (z)	0.0488
99% Percentile (z)	0.0575	95% USL	0.0605

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.79	Anderson-Darling GOF Test	
5% A-D Critical Value	0.74	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.179	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.209	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	7.147	k star (bias corrected MLE)	5.925
Theta hat (MLE)	0.00434	Theta star (bias corrected MLE)	0.00524
nu hat (MLE)	243	nu star (bias corrected)	201.5
MLE Mean (bias corrected)	0.0311		
MLE Sd (bias corrected)	0.0128	95% Percentile of Chisquare (2kstar)	20.82

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0072	Mean	0.0285
Maximum	0.0542	Median	0.029
SD	0.0116	CV	0.406
k hat (MLE)	5.459	k star (bias corrected MLE)	4.674
Theta hat (MLE)	0.00522	Theta star (bias corrected MLE)	0.0061
nu hat (MLE)	218.4	nu star (bias corrected)	187
MLE Mean (bias corrected)	0.0285	MLE Sd (bias corrected)	0.0132
95% Percentile of Chisquare (2kstar)	17.4	90% Percentile	0.0461

95% Percentile	0.0531	99% Percentile	0.0677

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.0671	0.0697	95% Approx. Gamma UPL	0.0542	0.0554
95% Gamma USL	0.0707	0.0738			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0275	SD (KM)	0.0127
Variance (KM)	1.6249E-4	SE of Mean (KM)	0.00294
k hat (KM)	4.646	k star (KM)	3.982
nu hat (KM)	185.8	nu star (KM)	159.3
theta hat (KM)	0.00591	theta star (KM)	0.0069
80% gamma percentile (KM)	0.0379	90% gamma percentile (KM)	0.0459
95% gamma percentile (KM)	0.0533	99% gamma percentile (KM)	0.0691

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.0762	0.0811	95% Approx. Gamma UPL	0.0592	0.0614
95% KM Gamma Percentile	0.056	0.0579	95% Gamma USL	0.0811	0.0869

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.805	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.892	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.217	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.207	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0284	Mean in Log Scale	-3.658
SD in Original Scale	0.0117	SD in Log Scale	0.486
95% UTL95% Coverage	0.0827	95% BCA UTL95% Coverage	0.0542
95% Bootstrap (%) UTL95% Coverage	0.0542	95% UPL (t)	0.0611
90% Percentile (z)	0.0481	95% Percentile (z)	0.0574
99% Percentile (z)	0.08	95% USL	0.0894

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-3.752	95% KM UTL (Lognormal)95% Coverage	0.106
KM SD of Logged Data	0.63	95% KM UPL (Lognormal)	0.0717
95% KM Percentile Lognormal (z)	0.0662	95% KM USL (Lognormal)	0.118

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0276	Mean in Log Scale	-3.734
SD in Original Scale	0.0128	SD in Log Scale	0.614
95% UTL95% Coverage	0.104	95% UPL (t)	0.071
90% Percentile (z)	0.0525	95% Percentile (z)	0.0656
99% Percentile (z)	0.0997	95% USL	0.115

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	20	95% UTL with95% Coverage	0.0542
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.054
95% USL	0.0542	95% KM Chebyshev UPL	0.0844

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_SVOCs_EPHs|Benzo(a)Pyrene|mg/kg

General Statistics			
Total Number of Observations	20	Number of Missing Observations	0
Number of Distinct Observations	19		
Number of Detects	19	Number of Non-Detects	1
Number of Distinct Detects	19	Number of Distinct Non-Detects	1
Minimum Detect	0.0045	Minimum Non-Detect	0.011
Maximum Detect	0.28	Maximum Non-Detect	0.011
Variance Detected	0.00414	Percent Non-Detects	5%
Mean Detected	0.0483	SD Detected	0.0644
Mean of Detected Logged Data	-3.663	SD of Detected Logged Data	1.154

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.658	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.901	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.248	Lilliefors GOF Test
5% Lilliefors Critical Value	0.197	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
KM Mean	0.0462	KM SD	0.0617
95% UTL95% Coverage	0.194	95% KM UPL (t)	0.156
90% KM Percentile (z)	0.125	95% KM Percentile (z)	0.148
99% KM Percentile (z)	0.19	95% KM USL	0.204

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	0.0461	SD	0.0634
95% UTL95% Coverage	0.198	95% UPL (t)	0.158
90% Percentile (z)	0.127	95% Percentile (z)	0.15
99% Percentile (z)	0.194	95% USL	0.208
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.497	Anderson-Darling GOF Test	
5% A-D Critical Value	0.772	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.144	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.205	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.923	k star (bias corrected MLE)	0.812
Theta hat (MLE)	0.0523	Theta star (bias corrected MLE)	0.0594
nu hat (MLE)	35.06	nu star (bias corrected)	30.86
MLE Mean (bias corrected)	0.0483		
MLE Sd (bias corrected)	0.0536	95% Percentile of Chisquare (2kstar)	5.24

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0045	Mean	0.0463
Maximum	0.28	Median	0.0218
SD	0.0632	CV	1.365
k hat (MLE)	0.914	k star (bias corrected MLE)	0.81
Theta hat (MLE)	0.0507	Theta star (bias corrected MLE)	0.0572
nu hat (MLE)	36.56	nu star (bias corrected)	32.41
MLE Mean (bias corrected)	0.0463	MLE Sd (bias corrected)	0.0515
95% Percentile of Chisquare (2kstar)	5.233	90% Percentile	0.112
95% Percentile	0.15	99% Percentile	0.238

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.232	0.249	95% Approx. Gamma UPL	0.153	0.157
95% Gamma USL	0.255	0.278			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0462	SD (KM)	0.0617
Variance (KM)	0.00381	SE of Mean (KM)	0.0142
k hat (KM)	0.559	k star (KM)	0.509
nu hat (KM)	22.37	nu star (KM)	20.35
theta hat (KM)	0.0826	theta star (KM)	0.0908
80% gamma percentile (KM)	0.0759	90% gamma percentile (KM)	0.124
95% gamma percentile (KM)	0.176	99% gamma percentile (KM)	0.304

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.225	0.242	95% Approx. Gamma UPL	0.149	0.153
95% KM Gamma Percentile	0.136	0.138	95% Gamma USL	0.248	0.27

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.965	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.901	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0882	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.197	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0462	Mean in Log Scale	-3.732
SD in Original Scale	0.0634	SD in Log Scale	1.165
95% UTL95% Coverage	0.39	95% BCA UTL95% Coverage	0.28
95% Bootstrap (%) UTL95% Coverage	0.28	95% UPL (t)	0.189
90% Percentile (z)	0.107	95% Percentile (z)	0.163
99% Percentile (z)	0.36	95% USL	0.471

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-3.732	95% KM UTL (Lognormal)95% Coverage	0.365
KM SD of Logged Data	1.137	95% KM UPL (Lognormal)	0.18
95% KM Percentile Lognormal (z)	0.155	95% KM USL (Lognormal)	0.438

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0461	Mean in Log Scale	-3.74
SD in Original Scale	0.0634	SD in Log Scale	1.175
95% UTL95% Coverage	0.397	95% UPL (t)	0.191
90% Percentile (z)	0.107	95% Percentile (z)	0.164
99% Percentile (z)	0.366	95% USL	0.479

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	20	95% UTL with95% Coverage	0.28
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by	0.642
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.271
95% USL	0.28	95% KM Chebyshev UPL	0.322

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Attachment D-1
BTV Output
Surface Soil

Attachment D-1
BTV Output
Surface Soil

Attachment D-1
BTV Output
Surface Soil

Attachment D-1
BTV Output
Surface Soil

Attachment D-1
BTV Output
Surface Soil

Background Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	ProUCL 5.19/24/2020 2:58:42 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

Benzo(b)fluoranthene

General Statistics

Total Number of Observations	19	Number of Distinct Observations	18
Minimum	0.0056	First Quartile	0.0145
Second Largest	0.13	Median	0.033
Maximum	0.14	Third Quartile	0.076
Mean	0.0507	SD	0.046
Coefficient of Variation	0.907	Skewness	0.94
Mean of logged Data	-3.435	SD of logged Data	1.036

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.423	d2max (for USL)	2.531

Normal GOF Test

Shapiro Wilk Test Statistic	0.838	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.901	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.196	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.197	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.162	90% Percentile (z)	0.11
95% UPL (t)	0.133	95% Percentile (z)	0.126
95% USL	0.167	99% Percentile (z)	0.158

Gamma GOF Test

A-D Test Statistic	0.418	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.763	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.115	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.203	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.242	k star (bias corrected MLE)	1.081
Theta hat (MLE)	0.0408	Theta star (bias corrected MLE)	0.0469
nu hat (MLE)	47.19	nu star (bias corrected)	41.08
MLE Mean (bias corrected)	0.0507	MLE Sd (bias corrected)	0.0488

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.156	90% Percentile	0.115
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.163	95% Percentile	0.148
95% WH Approx. Gamma UTL with 95% Coverage	0.228	99% Percentile	0.225
95% HW Approx. Gamma UTL with 95% Coverage	0.25		
95% WH USL	0.242	95% HW USL	0.267

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0927	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.197	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.396	90% Percentile (z)	0.121
95% UPL (t)	0.203	95% Percentile (z)	0.177
95% USL	0.443	99% Percentile (z)	0.358

Nonparametric Distribution Free Background Statistics
Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	19	95% UTL with 95% Coverage	0.14
Approx, f used to compute achieved CC	1	roximate Actual Confidence Coefficient achieved by UTL	0.623
		pproximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.14	95% BCA Bootstrap UTL with 95% Coverage	0.14
95% UPL	0.14	90% Percentile	0.13
90% Chebyshev UPL	0.192	95% Percentile	0.131
95% Chebyshev UPL	0.256	99% Percentile	0.138
95% USL	0.14		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Pyrene

General Statistics

Total Number of Observations	19	Number of Distinct Observations	18
Minimum	0.0068	First Quartile	0.015
Second Largest	0.18	Median	0.034
Maximum	0.18	Third Quartile	0.101
Mean	0.0643	SD	0.0634
Coefficient of Variation	0.985	Skewness	0.952
Mean of logged Data	-3.29	SD of logged Data	1.135

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.423	d2max (for USL)	2.531

Normal GOF Test

Shapiro Wilk Test Statistic	0.808	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.901	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.234	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.197	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	0.218	90% Percentile (z)	0.146
	95% UPL (t)	0.177	95% Percentile (z)	0.169
	95% USL	0.225	99% Percentile (z)	0.212

Gamma GOF Test

A-D Test Statistic	0.586	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.768	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.132	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.204	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.051	k star (bias corrected MLE)	0.92
Theta hat (MLE)	0.0612	Theta star (bias corrected MLE)	0.0699
nu hat (MLE)	39.94	nu star (bias corrected)	34.96
MLE Mean (bias corrected)	0.0643	MLE Sd (bias corrected)	0.0671

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		0.21	90% Percentile	0.151
95% Hawkins Wixley (HW) Approx. Gamma UPL		0.22	95% Percentile	0.199
95% WH Approx. Gamma UTL with	95% Coverage	0.314	99% Percentile	0.309
95% HW Approx. Gamma UTL with	95% Coverage	0.347		
	95% WH USL	0.334	95% HW USL	0.373

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.928	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.112	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.197	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	0.583	90% Percentile (z)	0.16
	95% UPL (t)	0.281	95% Percentile (z)	0.241
	95% USL	0.659	99% Percentile (z)	0.522

Nonparametric Distribution Free Background Statistics

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	19	95% UTL with 95% Coverage	0.18
Approx, f used to compute achieved CC	1	roximate Actual Confidence Coefficient achieved by UTL	0.623
		pproximate Sample Size needed to achieve specified CC	59

95% Percentile Bootstrap UTL with	95% Coverage	0.18	95% BCA Bootstrap UTL with	95% Coverage	0.18
	95% UPL	0.18		90% Percentile	0.172
	90% Chebyshev UPL	0.259		95% Percentile	0.18
	95% Chebyshev UPL	0.348		99% Percentile	0.18
	95% USL	0.18			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

total HMW PAH

General Statistics

Total Number of Observations	19	Number of Distinct Observations	18
Minimum	0.05	First Quartile	0.0965
Second Largest	0.9	Median	0.24
Maximum	0.95	Third Quartile	0.62
Mean	0.358	SD	0.319
Coefficient of Variation	0.89	Skewness	0.83
Mean of logged Data	-1.465	SD of logged Data	1.009

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.423	d2max (for USL)	2.531

Normal GOF Test

Shapiro Wilk Test Statistic	0.828	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.901	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.212	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.197	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.131		90% Percentile (z)	0.767
	95% UPL (t)	0.925		95% Percentile (z)	0.883
	95% USL	1.165		99% Percentile (z)	1.1

Gamma GOF Test

A-D Test Statistic	0.625	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.762	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.161	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.203	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.282	k star (bias corrected MLE)	1.115
Theta hat (MLE)	0.279	Theta star (bias corrected MLE)	0.321
nu hat (MLE)	48.71	nu star (bias corrected)	42.35
MLE Mean (bias corrected)	0.358	MLE Sd (bias corrected)	0.339

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.087	90% Percentile	0.803
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.135	95% Percentile	1.033
95% WH Approx. Gamma UTL with 95% Coverage	1.587	99% Percentile	1.562
95% HW Approx. Gamma UTL with 95% Coverage	1.733		
95% WH USL	1.683	95% HW USL	1.853

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.147	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.197	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	2.661	90% Percentile (z)	0.841
95% UPL (t)	1.39	95% Percentile (z)	1.214
95% USL	2.968	99% Percentile (z)	2.414

Nonparametric Distribution Free Background Statistics
Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	19	95% UTL with 95% Coverage	0.95
Approx, f used to compute achieved CC	1	roximate Actual Confidence Coefficient achieved by UTL	0.623
		pproximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.95	95% BCA Bootstrap UTL with 95% Coverage	0.95
95% UPL	0.95	90% Percentile	0.82
90% Chebyshev UPL	1.339	95% Percentile	0.905
95% Chebyshev UPL	1.784	99% Percentile	0.941
95% USL	0.95		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

total PAH

General Statistics

Total Number of Observations	19	Number of Distinct Observations	15
Minimum	0.088	First Quartile	0.155
Second Largest	1	Median	0.31
Maximum	1.1	Third Quartile	0.71
Mean	0.44	SD	0.358
Coefficient of Variation	0.814	Skewness	0.851
Mean of logged Data	-1.154	SD of logged Data	0.855

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.423	d2max (for USL)	2.531

Normal GOF Test

Shapiro Wilk Test Statistic	0.821	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.901	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.221	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.197	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	1.308	90% Percentile (z)	0.899
	95% UPL (t)	1.078	95% Percentile (z)	1.029
	95% USL	1.347	99% Percentile (z)	1.274

Gamma GOF Test

A-D Test Statistic	0.715	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.755	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.155	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.202	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.649	k star (bias corrected MLE)	1.423
Theta hat (MLE)	0.267	Theta star (bias corrected MLE)	0.309
nu hat (MLE)	62.65	nu star (bias corrected)	54.09
MLE Mean (bias corrected)	0.44	MLE Sd (bias corrected)	0.369

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.22	90% Percentile	0.929
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.259	95% Percentile	1.167
95% WH Approx. Gamma UTL with 95% Coverage	1.725	99% Percentile	1.705
95% HW Approx. Gamma UTL with 95% Coverage	1.844		
95% WH USL	1.822	95% HW USL	1.96

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.146	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.197	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	2.502	90% Percentile (z)	0.943
	95% UPL (t)	1.443	95% Percentile (z)	1.287
	95% USL	2.744	99% Percentile (z)	2.303

Nonparametric Distribution Free Background Statistics

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	19	95% UTL with 95% Coverage	1.1
Approx, f used to compute achieved CC	1	roximate Actual Confidence Coefficient achieved by UTL	0.623

			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	1.1	95% BCA Bootstrap UTL with	95% Coverage	1.1
	95% UPL	1.1		90% Percentile	1
	90% Chebyshev UPL	1.543		95% Percentile	1.01
	95% Chebyshev UPL	2.043		99% Percentile	1.082
	95% USL	1.1			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/24/2020 2:58:58 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
ferent or Future K Observations	1
lumber of Bootstrap Operations	2000

Anthracene

General Statistics

Total Number of Observations	19	Number of Missing Observations	0
Number of Distinct Observations	13		
Number of Detects	11	Number of Non-Detects	8
Number of Distinct Detects	11	Number of Distinct Non-Detects	3
Minimum Detect	0.0018	Minimum Non-Detect	0.0097
Maximum Detect	0.021	Maximum Non-Detect	0.011
Variance Detected	3.2864E-5	Percent Non-Detects	42.11%
Mean Detected	0.00738	SD Detected	0.00573
Mean of Detected Logged Data	-5.167	SD of Detected Logged Data	0.756

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.423	d2max (for USL)	2.531

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.834	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.262	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.00642	KM SD	0.00472
95% UTL95% Coverage	0.0178	95% KM UPL (t)	0.0148
90% KM Percentile (z)	0.0125	95% KM Percentile (z)	0.0142
99% KM Percentile (z)	0.0174	95% KM USL	0.0184

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.00653	SD	0.0044
95% UTL95% Coverage	0.0172	95% UPL (t)	0.0144
90% Percentile (z)	0.0122	95% Percentile (z)	0.0138
99% Percentile (z)	0.0168	95% USL	0.0177

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.506	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.248	**Kolmogorov-Smirnov GOF**

5% K-S Critical Value	0.258	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.085	k star (bias corrected MLE)	1.577
Theta hat (MLE)	0.00354	Theta star (bias corrected MLE)	0.00468
nu hat (MLE)	45.87	nu star (bias corrected)	34.69
MLE Mean (bias corrected)	0.00738		
MLE Sd (bias corrected)	0.00588	95% Percentile of Chisquare (2kstar)	8.08

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0018	Mean	0.00848
Maximum	0.021	Median	0.01
SD	0.00447	CV	0.527
k hat (MLE)	3.262	k star (bias corrected MLE)	2.782
Theta hat (MLE)	0.0026	Theta star (bias corrected MLE)	0.00305
nu hat (MLE)	123.9	nu star (bias corrected)	105.7
MLE Mean (bias corrected)	0.00848	MLE Sd (bias corrected)	0.00509
95% Percentile of Chisquare (2kstar)	11.93	90% Percentile	0.0153
95% Percentile	0.0182	99% Percentile	0.0245

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.0246	0.026	95% Approx. Gamma UPL	0.0188	0.0194
95% Gamma USL	0.0257	0.0273			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00642	SD (KM)	0.00472
Variance (KM)	2.2259E-5	SE of Mean (KM)	0.00129
k hat (KM)	1.849	k star (KM)	1.592
nu hat (KM)	70.25	nu star (KM)	60.49
theta hat (KM)	0.00347	theta star (KM)	0.00403
80% gamma percentile (KM)	0.00986	90% gamma percentile (KM)	0.0132
95% gamma percentile (KM)	0.0164	99% gamma percentile (KM)	0.0236

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.0209	0.0217	95% Approx. Gamma UPL	0.0155	0.0157
95% KM Gamma Percentile	0.0145	0.0146	95% Gamma USL	0.0219	0.0229

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.939	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.214	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.00625	Mean in Log Scale	-5.283
SD in Original Scale	0.00466	SD in Log Scale	0.638
95% UTL95% Coverage	0.0239	95% BCA UTL95% Coverage	0.021
95% Bootstrap (%) UTL95% Coverage	0.021	95% UPL (t)	0.0158
90% Percentile (z)	0.0115	95% Percentile (z)	0.0145
99% Percentile (z)	0.0224	95% USL	0.0256

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-5.283	95% KM UTL (Lognormal)95% Coverage	0.0258
KM SD of Logged Data	0.672	95% KM UPL (Lognormal)	0.0168
95% KM Percentile Lognormal (z)	0.0153	95% KM USL (Lognormal)	0.0278

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.00653	Mean in Log Scale	-5.194
SD in Original Scale	0.0044	SD in Log Scale	0.565
95% UTL95% Coverage	0.0218	95% UPL (t)	0.0152
90% Percentile (z)	0.0114	95% Percentile (z)	0.0141
99% Percentile (z)	0.0207	95% USL	0.0232

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	19	95% UTL with95% Coverage	0.021
Approx, f used to compute achieved CC	1	roximate Actual Confidence Coefficient achieved by UTL	0.623
pproximate Sample Size needed to achieve specified CC	59	95% UPL	0.021
95% USL	0.021	95% KM Chebyshev UPL	0.0275

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Chrysene

General Statistics

Total Number of Observations	19	Number of Missing Observations	0
Number of Distinct Observations	17		
Number of Detects	17	Number of Non-Detects	2
Number of Distinct Detects	16	Number of Distinct Non-Detects	2
Minimum Detect	0.0058	Minimum Non-Detect	0.0097
Maximum Detect	0.099	Maximum Non-Detect	0.01
Variance Detected	0.00122	Percent Non-Detects	10.53%
Mean Detected	0.0449	SD Detected	0.0349
Mean of Detected Logged Data	-3.471	SD of Detected Logged Data	0.955

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.423	d2max (for USL)	2.531

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.849	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.892	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.185	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.207	Detected Data appear Normal at 5% Significance Level

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0411	KM SD	0.034
95% UTL95% Coverage	0.123	95% KM UPL (t)	0.102
90% KM Percentile (z)	0.0846	95% KM Percentile (z)	0.097
99% KM Percentile (z)	0.12	95% KM USL	0.127

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0407	SD	0.0353
95% UTL95% Coverage	0.126	95% UPL (t)	0.103
90% Percentile (z)	0.0859	95% Percentile (z)	0.0987
99% Percentile (z)	0.123	95% USL	0.13

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.569	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.756	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.177	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.213	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.504	k star (bias corrected MLE)	1.277
Theta hat (MLE)	0.0299	Theta star (bias corrected MLE)	0.0352
nu hat (MLE)	51.12	nu star (bias corrected)	43.43
MLE Mean (bias corrected)	0.0449		
MLE Sd (bias corrected)	0.0397	95% Percentile of Chisquare (2kstar)	7.027

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0058	Mean	0.0412
Maximum	0.099	Median	0.03
SD	0.0347	CV	0.842
k hat (MLE)	1.387	k star (bias corrected MLE)	1.203
Theta hat (MLE)	0.0297	Theta star (bias corrected MLE)	0.0343
nu hat (MLE)	52.69	nu star (bias corrected)	45.71
MLE Mean (bias corrected)	0.0412	MLE Sd (bias corrected)	0.0376
95% Percentile of Chisquare (2kstar)	6.756	90% Percentile	0.0907

95% Percentile	0.116	99% Percentile	0.173

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.176	0.192	95% Approx. Gamma UPL	0.122	0.127
95% Gamma USL	0.187	0.205			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0411	SD (KM)	0.034
Variance (KM)	0.00115	SE of Mean (KM)	0.00804
k hat (KM)	1.461	k star (KM)	1.266
nu hat (KM)	55.52	nu star (KM)	48.09
theta hat (KM)	0.0281	theta star (KM)	0.0325
80% gamma percentile (KM)	0.0647	90% gamma percentile (KM)	0.0892
95% gamma percentile (KM)	0.113	99% gamma percentile (KM)	0.168

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.172	0.188	95% Approx. Gamma UPL	0.12	0.125
95% KM Gamma Percentile	0.11	0.114	95% Gamma USL	0.183	0.2

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.911	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.892	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.156	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.207	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0411	Mean in Log Scale	-3.606
SD in Original Scale	0.0349	SD in Log Scale	0.987
95% UTL95% Coverage	0.297	95% BCA UTL95% Coverage	0.099
95% Bootstrap (%) UTL95% Coverage	0.099	95% UPL (t)	0.157
90% Percentile (z)	0.0962	95% Percentile (z)	0.138
99% Percentile (z)	0.27	95% USL	0.33

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-3.611	95% KM UTL (Lognormal)95% Coverage	0.283
KM SD of Logged Data	0.969	95% KM UPL (Lognormal)	0.152
95% KM Percentile Lognormal (z)	0.133	95% KM USL (Lognormal)	0.314

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0407	Mean in Log Scale	-3.665
SD in Original Scale	0.0353	SD in Log Scale	1.071
95% UTL95% Coverage	0.343	95% UPL (t)	0.172
90% Percentile (z)	0.101	95% Percentile (z)	0.149
99% Percentile (z)	0.309	95% USL	0.385

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	19	95% UTL with95% Coverage	0.099
Approx, f used to compute achieved CC	1	roximate Actual Confidence Coefficient achieved by UTL	0.623
proximate Sample Size needed to achieve specified CC	59	95% UPL	0.099
95% USL	0.099	95% KM Chebyshev UPL	0.193

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Dibenzo(a,h)Anthracene

General Statistics

Total Number of Observations	19	Number of Missing Observations	0
Number of Distinct Observations	14		
Number of Detects	14	Number of Non-Detects	5
Number of Distinct Detects	13	Number of Distinct Non-Detects	2
Minimum Detect	0.002	Minimum Non-Detect	0.01
Maximum Detect	0.022	Maximum Non-Detect	0.011
Variance Detected	5.1876E-5	Percent Non-Detects	26.32%
Mean Detected	0.00947	SD Detected	0.0072
Mean of Detected Logged Data	-4.968	SD of Detected Logged Data	0.847

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.423	d2max (for USL)	2.531

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.867	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.874	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.216	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.226	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.00817	KM SD	0.00645
95% UTL95% Coverage	0.0238	95% KM UPL (t)	0.0197
90% KM Percentile (z)	0.0164	95% KM Percentile (z)	0.0188
99% KM Percentile (z)	0.0232	95% KM USL	0.0245

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0084	SD	0.00639
95% UTL95% Coverage	0.0239	95% UPL (t)	0.0198
90% Percentile (z)	0.0166	95% Percentile (z)	0.0189
99% Percentile (z)	0.0233	95% USL	0.0246

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.477	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.748	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.153	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.232	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.769	k star (bias corrected MLE)	1.438
Theta hat (MLE)	0.00535	Theta star (bias corrected MLE)	0.00659
nu hat (MLE)	49.54	nu star (bias corrected)	40.25
MLE Mean (bias corrected)	0.00947		
MLE Sd (bias corrected)	0.0079	95% Percentile of Chisquare (2kstar)	7.597

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.002	Mean	0.00961
Maximum	0.022	Median	0.01
SD	0.00613	CV	0.638
k hat (MLE)	2.35	k star (bias corrected MLE)	2.014
Theta hat (MLE)	0.00409	Theta star (bias corrected MLE)	0.00477
nu hat (MLE)	89.3	nu star (bias corrected)	76.53
MLE Mean (bias corrected)	0.00961	MLE Sd (bias corrected)	0.00677
95% Percentile of Chisquare (2kstar)	9.533	90% Percentile	0.0187
95% Percentile	0.0227	99% Percentile	0.0318

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.0321	0.0342	95% Approx. Gamma UPL	0.0237	0.0245
95% Gamma USL	0.0336	0.0361			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00817	SD (KM)	0.00645
Variance (KM)	4.1632E-5	SE of Mean (KM)	0.00157
k hat (KM)	1.604	k star (KM)	1.386
nu hat (KM)	60.95	nu star (KM)	52.66
theta hat (KM)	0.00509	theta star (KM)	0.0059
80% gamma percentile (KM)	0.0128	90% gamma percentile (KM)	0.0174
95% gamma percentile (KM)	0.0219	99% gamma percentile (KM)	0.0321

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.0299	0.0315	95% Approx. Gamma UPL	0.0214	0.0219
95% KM Gamma Percentile	0.0199	0.0203	95% Gamma USL	0.0315	0.0334

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.922	**Shapiro Wilk GOF Test**	

5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.14	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.226	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.00817	Mean in Log Scale	-5.099
SD in Original Scale	0.00657	SD in Log Scale	0.779
95% UTL95% Coverage	0.0403	95% BCA UTL95% Coverage	0.022
95% Bootstrap (%) UTL95% Coverage	0.022	95% UPL (t)	0.0244
90% Percentile (z)	0.0166	95% Percentile (z)	0.022
99% Percentile (z)	0.0374	95% USL	0.0439

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-5.113	95% KM UTL (Lognormal)95% Coverage	0.0401
KM SD of Logged Data	0.783	95% KM UPL (Lognormal)	0.0242
95% KM Percentile Lognormal (z)	0.0218	95% KM USL (Lognormal)	0.0437

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0084	Mean in Log Scale	-5.035
SD in Original Scale	0.00639	SD in Log Scale	0.729
95% UTL95% Coverage	0.038	95% UPL (t)	0.0238
90% Percentile (z)	0.0166	95% Percentile (z)	0.0216
99% Percentile (z)	0.0355	95% USL	0.0412

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	19	95% UTL with95% Coverage	0.022
Approx, f used to compute achieved CC	1	roximate Actual Confidence Coefficient achieved by UTL	0.623
pproximate Sample Size needed to achieve specified CC	59	95% UPL	0.022
95% USL	0.022	95% KM Chebyshev UPL	0.037

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.19/22/2020 10:58:07 AM
From File	C:\Users\scesnyc\Desktop\DeskTop Folder\Blue Beach\SB_Input.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

RA_SO_Metals|Aluminum|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	19
Minimum	6730	First Quartile	8573
Second Largest	13100	Median	10200
Maximum	13300	Third Quartile	11025
Mean	9929	SD	2027
Coefficient of Variation	0.204	Skewness	0.0039
Mean of logged Data	9.183	SD of logged Data	0.211

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.957	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.103	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	14785	90% Percentile (z)	12526
95% UPL (t)	13520	95% Percentile (z)	13262
95% USL	15110	99% Percentile (z)	14644

Gamma GOF Test

A-D Test Statistic	0.313	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.13	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.193	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	24.4	k star (bias corrected MLE)	20.78
Theta hat (MLE)	406.9	Theta star (bias corrected MLE)	477.9
nu hat (MLE)	976.1	nu star (bias corrected)	831
MLE Mean (bias corrected)	9929	MLE Sd (bias corrected)	2178

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	13881	90% Percentile	12803
95% Hawkins Wixley (HW) Approx. Gamma UPL	13939	95% Percentile	13763
95% WH Approx. Gamma UTL with 95% Coverage	15554	99% Percentile	15686
95% HW Approx. Gamma UTL with 95% Coverage	15682		
95% WH USL	16005	95% HW USL	16155

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.947	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.139	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	16125	90% Percentile (z)	12746
95% UPL (t)	14135	95% Percentile (z)	13761
95% USL	16680	99% Percentile (z)	15889

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	13300
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by U	0.642
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	13300	95% BCA Bootstrap UTL with 95% Coverage	13300
95% UPL	13290	90% Percentile	12740
90% Chebyshev UPL	16159	95% Percentile	13110
95% Chebyshev UPL	18981	99% Percentile	13262
95% USL	13300		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Cadmium|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	19
Minimum	0.02	First Quartile	0.0393
Second Largest	0.0753	Median	0.0465
Maximum	0.0812	Third Quartile	0.0584
Mean	0.0493	SD	0.0172
Coefficient of Variation	0.349	Skewness	0.282
Mean of logged Data	-3.073	SD of logged Data	0.375

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.965	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.107	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.0904	90% Percentile (z)	0.0713
95% UPL (t)	0.0797	95% Percentile (z)	0.0775
95% USL	0.0932	99% Percentile (z)	0.0893

Gamma GOF Test

A-D Test Statistic	0.217	Anderson-Darling Gamma GOF Test	

5% A-D Critical Value	0.743	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0973	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	8.121	k star (bias corrected MLE)	6.936
Theta hat (MLE)	0.00607	Theta star (bias corrected MLE)	0.00711
nu hat (MLE)	324.8	nu star (bias corrected)	277.4
MLE Mean (bias corrected)	0.0493	MLE Sd (bias corrected)	0.0187

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.085	90% Percentile	0.0743
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.086	95% Percentile	0.0835
95% WH Approx. Gamma UTL with 95% Coverage	0.102	99% Percentile	0.103
95% HW Approx. Gamma UTL with 95% Coverage	0.104		
95% WH USL	0.107	95% HW USL	0.109

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.962	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.12	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.114	90% Percentile (z)	0.0749
95% UPL (t)	0.09	95% Percentile (z)	0.0858
95% USL	0.121	99% Percentile (z)	0.111

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	0.0812
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by U	0.642
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.0812	95% BCA Bootstrap UTL with 95% Coverage	0.0812
95% UPL	0.0809	90% Percentile	0.0752
90% Chebyshev UPL	0.102	95% Percentile	0.0756
95% Chebyshev UPL	0.126	99% Percentile	0.0801
95% USL	0.0812		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Cobalt|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Minimum	2.34	First Quartile	2.665
Second Largest	7.19	Median	3.565
Maximum	7.37	Third Quartile	5.008
Mean	4.122	SD	1.662
Coefficient of Variation	0.403	Skewness	0.859

Mean of logged Data	1.345	SD of logged Data	0.381

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.868	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.168	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	8.104	90% Percentile (z)	6.252
95% UPL (t)	7.067	95% Percentile (z)	6.856
95% USL	8.371	99% Percentile (z)	7.988

Gamma GOF Test

A-D Test Statistic	0.702	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.744	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.155	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.167	k star (bias corrected MLE)	6.125
Theta hat (MLE)	0.575	Theta star (bias corrected MLE)	0.673
nu hat (MLE)	286.7	nu star (bias corrected)	245
MLE Mean (bias corrected)	4.122	MLE Sd (bias corrected)	1.665

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	7.315	90% Percentile	6.347
95% Hawkins Wixley (HW) Approx. Gamma UPL	7.361	95% Percentile	7.187
95% WH Approx. Gamma UTL with 95% Coverage	8.859	99% Percentile	8.945
95% HW Approx. Gamma UTL with 95% Coverage	9.003		
95% WH USL	9.289	95% HW USL	9.467

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.914	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.139	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	9.553	90% Percentile (z)	6.251
95% UPL (t)	7.533	95% Percentile (z)	7.178
95% USL	10.16	99% Percentile (z)	9.303

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	7.37
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by U	0.642
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	7.37	95% BCA Bootstrap UTL with 95% Coverage	7.37
95% UPL	7.361	90% Percentile	6.83

90% Chebyshev UPL	9.231	95% Percentile	7.199
95% Chebyshev UPL	11.55	99% Percentile	7.336
95% USL	7.37		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Copper|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	19
Minimum	4.85	First Quartile	5.883
Second Largest	12.4	Median	7.665
Maximum	13.7	Third Quartile	10.63
Mean	8.351	SD	2.792
Coefficient of Variation	0.334	Skewness	0.538
Mean of logged Data	2.07	SD of logged Data	0.329

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.906	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.151	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	15.04	90% Percentile (z)	11.93
95% UPL (t)	13.3	95% Percentile (z)	12.94
95% USL	15.49	99% Percentile (z)	14.85

Gamma GOF Test

A-D Test Statistic	0.585	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.15	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	9.787	k star (bias corrected MLE)	8.352
Theta hat (MLE)	0.853	Theta star (bias corrected MLE)	1
nu hat (MLE)	391.5	nu star (bias corrected)	334.1
MLE Mean (bias corrected)	8.351	MLE Sd (bias corrected)	2.89

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	13.81	90% Percentile	12.2
95% Hawkins Wixley (HW) Approx. Gamma UPL	13.89	95% Percentile	13.6
95% WH Approx. Gamma UTL with 95% Coverage	16.34	99% Percentile	16.49
95% HW Approx. Gamma UTL with 95% Coverage	16.58		
95% WH USL	17.04	95% HW USL	17.32

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.93	Shapiro Wilk Lognormal GOF Test	

5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.141	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	17.45	90% Percentile (z)	12.09
95% UPL (t)	14.21	95% Percentile (z)	13.63
95% USL	18.4	99% Percentile (z)	17.05

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	13.7
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by U	0.642
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	13.7	95% BCA Bootstrap UTL with 95% Coverage	13.7
95% UPL	13.64	90% Percentile	12.04
90% Chebyshev UPL	16.93	95% Percentile	12.47
95% Chebyshev UPL	20.82	99% Percentile	13.45
95% USL	13.7		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Iron|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	17
Minimum	8830	First Quartile	12650
Second Largest	17800	Median	13200
Maximum	19700	Third Quartile	14750
Mean	13707	SD	2496
Coefficient of Variation	0.182	Skewness	0.584
Mean of logged Data	9.51	SD of logged Data	0.181

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.944	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.201	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data Not Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	19688	90% Percentile (z)	16906
95% UPL (t)	18129	95% Percentile (z)	17813
95% USL	20088	99% Percentile (z)	19514

Gamma GOF Test

A-D Test Statistic	0.552	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level	

K-S Test Statistic	0.178	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.193	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	32.3	k star (bias corrected MLE)	27.49
Theta hat (MLE)	424.3	Theta star (bias corrected MLE)	498.6
nu hat (MLE)	1292	nu star (bias corrected)	1100
MLE Mean (bias corrected)	13707	MLE Sd (bias corrected)	2614

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	18401	90% Percentile	17145
95% Hawkins Wixley (HW) Approx. Gamma UPL	18447	95% Percentile	18271
95% WH Approx. Gamma UTL with 95% Coverage	20345	99% Percentile	20509
95% HW Approx. Gamma UTL with 95% Coverage	20454		
95% WH USL	20866	95% HW USL	20996

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.956	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.167	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	20836	90% Percentile (z)	17024
95% UPL (t)	18607	95% Percentile (z)	18183
95% USL	21452	99% Percentile (z)	20575

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	19700
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by U	0.642
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	19700	95% BCA Bootstrap UTL with 95% Coverage	19700
95% UPL	19605	90% Percentile	16810
90% Chebyshev UPL	21380	95% Percentile	17895
95% Chebyshev UPL	24856	99% Percentile	19339
95% USL	19700		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Lead|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Minimum	5.79	First Quartile	8.435
Second Largest	38.3	Median	13.3
Maximum	54	Third Quartile	20.05
Mean	17.14	SD	12.68
Coefficient of Variation	0.74	Skewness	1.754
Mean of logged Data	2.637	SD of logged Data	0.626

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.771	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.243	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	47.53	90% Percentile (z)	33.4
95% UPL (t)	39.62	95% Percentile (z)	38.01
95% USL	49.57	99% Percentile (z)	46.65

Gamma GOF Test

A-D Test Statistic	1.006	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.749	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.201	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.195	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.602	k star (bias corrected MLE)	2.245
Theta hat (MLE)	6.589	Theta star (bias corrected MLE)	7.637
nu hat (MLE)	104.1	nu star (bias corrected)	89.79
MLE Mean (bias corrected)	17.14	MLE Sd (bias corrected)	11.44

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	40.32	90% Percentile	32.45
95% Hawkins Wixley (HW) Approx. Gamma UPL	40.68	95% Percentile	39.22
95% WH Approx. Gamma UTL with 95% Coverage	53.59	99% Percentile	54.12
95% HW Approx. Gamma UTL with 95% Coverage	55.2		
95% WH USL	57.42	95% HW USL	59.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.909	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.183	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	62.67	90% Percentile (z)	31.18
95% UPL (t)	42.39	95% Percentile (z)	39.15
95% USL	69.31	99% Percentile (z)	60

Nonparametric Distribution Free Background Statistics

Data appear Lognormal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	54
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by U	0.642
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	54	95% BCA Bootstrap UTL with 95% Coverage	54
95% UPL	53.22	90% Percentile	37.85
90% Chebyshev UPL	56.13	95% Percentile	39.09

95% Chebyshev UPL	73.8	99% Percentile	51.02
95% USL	54		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Manganese|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	19
Minimum	74.8	First Quartile	117
Second Largest	217	Median	130
Maximum	218	Third Quartile	161.8
Mean	143.5	SD	40.86
Coefficient of Variation	0.285	Skewness	0.631
Mean of logged Data	4.928	SD of logged Data	0.281

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.913	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.182	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	241.4	90% Percentile (z)	195.8
95% UPL (t)	215.9	95% Percentile (z)	210.7
95% USL	247.9	99% Percentile (z)	238.5

Gamma GOF Test

A-D Test Statistic	0.558	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.151	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.194	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	13.45	k star (bias corrected MLE)	11.47
Theta hat (MLE)	10.66	Theta star (bias corrected MLE)	12.51
nu hat (MLE)	538.2	nu star (bias corrected)	458.8
MLE Mean (bias corrected)	143.5	MLE Sd (bias corrected)	42.36

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	222.1	90% Percentile	199.7
95% Hawkins Wixley (HW) Approx. Gamma UPL	223.3	95% Percentile	219.5
95% WH Approx. Gamma UTL with 95% Coverage	257.4	99% Percentile	259.9
95% HW Approx. Gamma UTL with 95% Coverage	260.3		
95% WH USL	267	95% HW USL	270.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.948	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	

Lilliefors Test Statistic	0.133	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	271.1	90% Percentile (z)	198.1
95% UPL (t)	227.4	95% Percentile (z)	219.4
95% USL	283.6	99% Percentile (z)	265.8

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	218
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by U	0.642
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	218	95% BCA Bootstrap UTL with 95% Coverage	218
95% UPL	218	90% Percentile	206.2
90% Chebyshev UPL	269.1	95% Percentile	217.1
95% Chebyshev UPL	326	99% Percentile	217.8
95% USL	218		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Thallium|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	17
Minimum	0.0971	First Quartile	0.117
Second Largest	0.166	Median	0.14
Maximum	0.167	Third Quartile	0.146
Mean	0.133	SD	0.0203
Coefficient of Variation	0.153	Skewness	-0.112
Mean of logged Data	-2.03	SD of logged Data	0.157

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.946	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.168	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.182	90% Percentile (z)	0.159
95% UPL (t)	0.169	95% Percentile (z)	0.166
95% USL	0.185	99% Percentile (z)	0.18

Gamma GOF Test

A-D Test Statistic	0.549	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.186	Kolmogorov-Smirnov Gamma GOF Test	

5% K-S Critical Value	0.193	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	43.71	k star (bias corrected MLE)	37.18
Theta hat (MLE)	0.00304	Theta star (bias corrected MLE)	0.00357
nu hat (MLE)	1748	nu star (bias corrected)	1487
MLE Mean (bias corrected)	0.133	MLE Sd (bias corrected)	0.0218

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.172	90% Percentile	0.161
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.172	95% Percentile	0.171
95% WH Approx. Gamma UTL with 95% Coverage	0.187	99% Percentile	0.189
95% HW Approx. Gamma UTL with 95% Coverage	0.188		
95% WH USL	0.192	95% HW USL	0.193

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.939	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.19	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.191	90% Percentile (z)	0.161
95% UPL (t)	0.173	95% Percentile (z)	0.17
95% USL	0.196	99% Percentile (z)	0.189

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	0.167
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by U	0.642
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.167	95% BCA Bootstrap UTL with 95% Coverage	0.167
95% UPL	0.167	90% Percentile	0.153
90% Chebyshev UPL	0.195	95% Percentile	0.166
95% Chebyshev UPL	0.224	99% Percentile	0.167
95% USL	0.167		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_Metals|Arsenic|mg/kg

General Statistics

Total Number of Observations	20	Number of Distinct Observations	20
Minimum	1.63	First Quartile	2.173
Second Largest	3.43	Median	2.38
Maximum	4.03	Third Quartile	2.585
Mean	2.462	SD	0.528
Coefficient of Variation	0.215	Skewness	1.548
Mean of logged Data	0.882	SD of logged Data	0.197

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test

Shapiro Wilk Test Statistic	0.872	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.19	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	3.728	90% Percentile (z)	3.139
95% UPL (t)	3.398	95% Percentile (z)	3.331
95% USL	3.813	99% Percentile (z)	3.691

Gamma GOF Test

A-D Test Statistic	0.596	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.157	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.193	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	25.92	k star (bias corrected MLE)	22.07
Theta hat (MLE)	0.095	Theta star (bias corrected MLE)	0.112
nu hat (MLE)	1037	nu star (bias corrected)	882.7
MLE Mean (bias corrected)	2.462	MLE Sd (bias corrected)	0.524

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	3.409	90% Percentile	3.153
95% Hawkins Wixley (HW) Approx. Gamma UPL	3.412	95% Percentile	3.383
95% WH Approx. Gamma UTL with 95% Coverage	3.808	99% Percentile	3.842
95% HW Approx. Gamma UTL with 95% Coverage	3.823		
95% WH USL	3.916	95% HW USL	3.934

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.943	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.905	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.149	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.192	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	3.875	90% Percentile (z)	3.11
95% UPL (t)	3.426	95% Percentile (z)	3.341
95% USL	4	99% Percentile (z)	3.822

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	20	95% UTL with 95% Coverage	4.03
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by U	0.642
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	4.03	95% BCA Bootstrap UTL with 95% Coverage	4.03
95% UPL	4	90% Percentile	2.935
90% Chebyshev UPL	4.086	95% Percentile	3.46
95% Chebyshev UPL	4.822	99% Percentile	3.916

95% USL	4.03

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/22/2020 10:49:32 AM
From File	SB_Input.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

RA_SO_Metals|Antimony|mg/kg

General Statistics

Total Number of Observations	20	Number of Missing Observations	0
Number of Distinct Observations	15		
Number of Detects	19	Number of Non-Detects	1
Number of Distinct Detects	14	Number of Distinct Non-Detects	1
Minimum Detect	0.016	Minimum Non-Detect	0.051
Maximum Detect	0.065	Maximum Non-Detect	0.051
Variance Detected	1.3954E-4	Percent Non-Detects	5%
Mean Detected	0.0413	SD Detected	0.0118
Mean of Detected Logged Data	-3.236	SD of Detected Logged Data	0.34

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.957	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.901	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.14	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.197	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0412	KM SD	0.0114
95% UTL95% Coverage	0.0685	95% KM UPL (t)	0.0614
90% KM Percentile (z)	0.0558	95% KM Percentile (z)	0.06
99% KM Percentile (z)	0.0678	95% KM USL	0.0704

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0405	SD	0.012
95% UTL95% Coverage	0.0693	95% UPL (t)	0.0618
90% Percentile (z)	0.0559	95% Percentile (z)	0.0603
99% Percentile (z)	0.0685	95% USL	0.0712

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.735	Anderson-Darling GOF Test	
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.18	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.199	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	10.57	k star (bias corrected MLE)	8.939
Theta hat (MLE)	0.0039	Theta star (bias corrected MLE)	0.00462

nu hat (MLE)	401.8	nu star (bias corrected)	339.7
MLE Mean (bias corrected)	0.0413		
MLE Sd (bias corrected)	0.0138	95% Percentile of Chisquare (2kstar)	28.71

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.016	Mean	0.0411
Maximum	0.065	Median	0.041
SD	0.0115	CV	0.28
k hat (MLE)	11.1	k star (bias corrected MLE)	9.464
Theta hat (MLE)	0.00371	Theta star (bias corrected MLE)	0.00435
nu hat (MLE)	443.8	nu star (bias corrected)	378.6
MLE Mean (bias corrected)	0.0411	MLE Sd (bias corrected)	0.0134
95% Percentile of Chisquare (2kstar)	30.05	90% Percentile	0.0589
95% Percentile	0.0653	99% Percentile	0.0784

The following statistics are computed using Gamma ROS Statistics on Imputed Data
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.0777	0.0795	95% Approx. Gamma UPL	0.0662	0.0671
95% Gamma USL	0.0808	0.0829			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0412	SD (KM)	0.0114
Variance (KM)	1.3075E-4	SE of Mean (KM)	0.00268
k hat (KM)	12.95	k star (KM)	11.04
nu hat (KM)	518.1	nu star (KM)	441.7
theta hat (KM)	0.00318	theta star (KM)	0.00373
80% gamma percentile (KM)	0.0511	90% gamma percentile (KM)	0.0576
95% gamma percentile (KM)	0.0634	99% gamma percentile (KM)	0.0753

The following statistics are computed using gamma distribution and KM estimates
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.0775	0.0793	95% Approx. Gamma UPL	0.0661	0.067
95% KM Gamma Percentile	0.0639	0.0647	95% Gamma USL	0.0806	0.0827

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.881	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.208	Lilliefors GOF Test
5% Lilliefors Critical Value	0.197	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0411	Mean in Log Scale	-3.238
SD in Original Scale	0.0115	SD in Log Scale	0.331
95% UTL95% Coverage	0.0867	95% BCA UTL95% Coverage	0.065
95% Bootstrap (%) UTL95% Coverage	0.065	95% UPL (t)	0.0705
90% Percentile (z)	0.0599	95% Percentile (z)	0.0676
99% Percentile (z)	0.0847	95% USL	0.0914

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-3.238	95% KM UTL (Lognormal)95% Coverage	0.0865

KM SD of Logged Data	0.33	95% KM UPL (Lognormal)	0.0704
95% KM Percentile Lognormal (z)	0.0675	95% KM USL (Lognormal)	0.0912

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0405	Mean in Log Scale	-3.257
SD in Original Scale	0.012	SD in Log Scale	0.345
95% UTL95% Coverage	0.0879	95% UPL (t)	0.0709
90% Percentile (z)	0.0598	95% Percentile (z)	0.0678
99% Percentile (z)	0.0858	95% USL	0.0929

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	20	95% UTL with95% Coverage	0.065
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by U	0.642
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.0645
95% USL	0.065	95% KM Chebyshev UPL	0.0922

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_SVOCs_EPHs|Naphthalene|mg/kg

General Statistics

Total Number of Observations	20	Number of Missing Observations	0
Number of Distinct Observations	10		
Number of Detects	5	Number of Non-Detects	15
Number of Distinct Detects	5	Number of Distinct Non-Detects	5
Minimum Detect	0.0035	Minimum Non-Detect	0.0098
Maximum Detect	0.014	Maximum Non-Detect	0.012
Variance Detected	1.9957E-5	Percent Non-Detects	75%
Mean Detected	0.00888	SD Detected	0.00447
Mean of Detected Logged Data	-4.841	SD of Detected Logged Data	0.565

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.91	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.238	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.00657	KM SD	0.0028
95% UTL95% Coverage	0.0133	95% KM UPL (t)	0.0115
90% KM Percentile (z)	0.0102	95% KM Percentile (z)	0.0112
99% KM Percentile (z)	0.0131	95% KM USL	0.0137

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.00629	SD	0.00259

95% UTL95% Coverage	0.0125	95% UPL (t)	0.0109
90% Percentile (z)	0.0096	95% Percentile (z)	0.0105
99% Percentile (z)	0.0123	95% USL	0.0129

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.323	Anderson-Darling GOF Test	
5% A-D Critical Value	0.681	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.244	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	4.417	k star (bias corrected MLE)	1.9
Theta hat (MLE)	0.00201	Theta star (bias corrected MLE)	0.00467
nu hat (MLE)	44.17	nu star (bias corrected)	19
MLE Mean (bias corrected)	0.00888		
MLE Sd (bias corrected)	0.00644	95% Percentile of Chisquare (2kstar)	9.162

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0035	Mean	0.00972
Maximum	0.014	Median	0.01
SD	0.00211	CV	0.217
k hat (MLE)	16.47	k star (bias corrected MLE)	14.03
Theta hat (MLE)	5.9008E-4	Theta star (bias corrected MLE)	6.9257E-4
nu hat (MLE)	658.9	nu star (bias corrected)	561.4
MLE Mean (bias corrected)	0.00972	MLE Sd (bias corrected)	0.00259
95% Percentile of Chisquare (2kstar)	41.42	90% Percentile	0.0132
95% Percentile	0.0143	99% Percentile	0.0167

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.0166	0.0169	95% Approx. Gamma UPL	0.0145	0.0147
95% Gamma USL	0.0171	0.0176			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00657	SD (KM)	0.0028
Variance (KM)	7.8151E-6	SE of Mean (KM)	0.00112
k hat (KM)	5.523	k star (KM)	4.728
nu hat (KM)	220.9	nu star (KM)	189.1
theta hat (KM)	0.00119	theta star (KM)	0.00139
80% gamma percentile (KM)	0.00889	90% gamma percentile (KM)	0.0106
95% gamma percentile (KM)	0.0122	99% gamma percentile (KM)	0.0155

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.0146	0.0149	95% Approx. Gamma UPL	0.0119	0.012
95% KM Gamma Percentile	0.0114	0.0115	95% Gamma USL	0.0153	0.0157

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.922	Shapiro Wilk GOF Test	

5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.211	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.00646	Mean in Log Scale	-5.119
SD in Original Scale	0.00283	SD in Log Scale	0.39
95% UTL95% Coverage	0.0152	95% BCA UTL95% Coverage	0.014
95% Bootstrap (%) UTL95% Coverage	0.014	95% UPL (t)	0.0119
90% Percentile (z)	0.00986	95% Percentile (z)	0.0114
99% Percentile (z)	0.0148	95% USL	0.0162

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-5.109	95% KM UTL (Lognormal)95% Coverage	0.0161
KM SD of Logged Data	0.409	95% KM UPL (Lognormal)	0.0125
95% KM Percentile Lognormal (z)	0.0118	95% KM USL (Lognormal)	0.0172

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.00629	Mean in Log Scale	-5.125
SD in Original Scale	0.00259	SD in Log Scale	0.316
95% UTL95% Coverage	0.0127	95% UPL (t)	0.0104
90% Percentile (z)	0.00892	95% Percentile (z)	0.01
99% Percentile (z)	0.0124	95% USL	0.0133

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	20	95% UTL with95% Coverage	0.014
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by U	0.642
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.014
95% USL	0.014	95% KM Chebyshev UPL	0.0191

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SO_SVOCs_EPHs|Benzo(a)Pyrene|mg/kg

General Statistics

Total Number of Observations	20	Number of Missing Observations	0
Number of Distinct Observations	14		
Number of Detects	11	Number of Non-Detects	9
Number of Distinct Detects	10	Number of Distinct Non-Detects	4
Minimum Detect	0.019	Minimum Non-Detect	0.0098
Maximum Detect	0.8	Maximum Non-Detect	0.011
Variance Detected	0.0526	Percent Non-Detects	45%
Mean Detected	0.134	SD Detected	0.229
Mean of Detected Logged Data	-2.811	SD of Detected Logged Data	1.196

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.396	d2max (for USL)	2.557

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.555	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.313	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0782	KM SD	0.174
95% UTL95% Coverage	0.494	95% KM UPL (t)	0.386
90% KM Percentile (z)	0.301	95% KM Percentile (z)	0.364
99% KM Percentile (z)	0.482	95% KM USL	0.522

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0761	SD	0.179
95% UTL95% Coverage	0.505	95% UPL (t)	0.393
90% Percentile (z)	0.305	95% Percentile (z)	0.37
99% Percentile (z)	0.492	95% USL	0.534

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.995	Anderson-Darling GOF Test	
5% A-D Critical Value	0.763	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.278	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.265	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.747	k star (bias corrected MLE)	0.604
Theta hat (MLE)	0.18	Theta star (bias corrected MLE)	0.222
nu hat (MLE)	16.43	nu star (bias corrected)	13.28
MLE Mean (bias corrected)	0.134		
MLE Sd (bias corrected)	0.173	95% Percentile of Chisquare (2kstar)	4.336

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0783
Maximum	0.8	Median	0.0193
SD	0.178	CV	2.274
k hat (MLE)	0.58	k star (bias corrected MLE)	0.526
Theta hat (MLE)	0.135	Theta star (bias corrected MLE)	0.149
nu hat (MLE)	23.2	nu star (bias corrected)	21.05
MLE Mean (bias corrected)	0.0783	MLE Sd (bias corrected)	0.108
95% Percentile of Chisquare (2kstar)	3.97	90% Percentile	0.21
95% Percentile	0.295	99% Percentile	0.505

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.445	0.453	95% Approx. Gamma UPL	0.275	0.266
95% Gamma USL	0.498	0.514			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0782	SD (KM)	0.174

Variance (KM)	0.0301	SE of Mean (KM)	0.0407
k hat (KM)	0.203	k star (KM)	0.206
nu hat (KM)	8.118	nu star (KM)	8.234
theta hat (KM)	0.385	theta star (KM)	0.38
80% gamma percentile (KM)	0.105	90% gamma percentile (KM)	0.236
95% gamma percentile (KM)	0.4	99% gamma percentile (KM)	0.847

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.427	0.432	95% Approx. Gamma UPL	0.265	0.255
95% KM Gamma Percentile	0.239	0.227	95% Gamma USL	0.477	0.49

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.869	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.218	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0751	Mean in Log Scale	-4.259
SD in Original Scale	0.179	SD in Log Scale	1.915
95% UTL95% Coverage	1.389	95% BCA UTL95% Coverage	0.8
95% Bootstrap (%) UTL95% Coverage	0.8	95% UPL (t)	0.42
90% Percentile (z)	0.164	95% Percentile (z)	0.33
99% Percentile (z)	1.216	95% USL	1.889

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-3.627	95% KM UTL (Lognormal)95% Coverage	0.515
KM SD of Logged Data	1.237	95% KM UPL (Lognormal)	0.238
95% KM Percentile Lognormal (z)	0.203	95% KM USL (Lognormal)	0.628

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0761	Mean in Log Scale	-3.917
SD in Original Scale	0.179	SD in Log Scale	1.526
95% UTL95% Coverage	0.77	95% UPL (t)	0.297
90% Percentile (z)	0.141	95% Percentile (z)	0.245
99% Percentile (z)	0.693	95% USL	0.984

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	20	95% UTL with95% Coverage	0.8
Approx, f used to compute achieved CC	1.053	Approximate Actual Confidence Coefficient achieved by U	0.642
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.77
95% USL	0.8	95% KM Chebyshev UPL	0.853

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.19/22/2020 12:21:30 PM
From File	C:\Users\scesnyc\Desktop\DeskTop Folder\Blue Beach\Input\SD_Input.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

RA_SE_Metals|Aluminum|mg/kg

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6
Minimum	5050	First Quartile	6000
Second Largest	7420	Median	6880
Maximum	7890	Third Quartile	7420
Mean	6648	SD	1136
Coefficient of Variation	0.171	Skewness	-0.558
Mean of logged Data	8.79	SD of logged Data	0.179

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	4.203	d2max (for USL)	1.671

Normal GOF Test

Shapiro Wilk Test Statistic	0.963	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.181	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	11424	90% Percentile (z)	8104
95% UPL (t)	9302	95% Percentile (z)	8517
95% USL	8547	99% Percentile (z)	9292

Gamma GOF Test

A-D Test Statistic	0.252	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.678	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.207	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	40.46	k star (bias corrected MLE)	16.32
Theta hat (MLE)	164.3	Theta star (bias corrected MLE)	407.4
nu hat (MLE)	404.6	nu star (bias corrected)	163.2
MLE Mean (bias corrected)	6648	MLE Sd (bias corrected)	1646

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	9698	90% Percentile	8825
95% Hawkins Wixley (HW) Approx. Gamma UPL	9760	95% Percentile	9566
95% WH Approx. Gamma UTL with 95% Coverage	12785	99% Percentile	11062
95% HW Approx. Gamma UTL with 95% Coverage	13028		
95% WH USL	8734	95% HW USL	8762

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.946	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.203	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	13923	90% Percentile (z)	8257
95% UPL (t)	9969	95% Percentile (z)	8811
95% USL	8853	99% Percentile (z)	9953

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	5	95% UTL with 95% Coverage	7890
Approx, f used to compute achieved CC	0.263	Approximate Actual Confidence Coefficient achieved by U	0.226
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	7890	95% BCA Bootstrap UTL with 95% Coverage	7890
95% UPL	7890	90% Percentile	7702
90% Chebyshev UPL	10383	95% Percentile	7796
95% Chebyshev UPL	12074	99% Percentile	7871
95% USL	7890		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Arsenic|mg/kg

General Statistics			
Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	4
Minimum	0.3	First Quartile	1.845
Second Largest	2.78	Median	2.64
Maximum	4.7	Third Quartile	2.74
Mean	2.401	SD	1.382
Coefficient of Variation	0.576	Skewness	0.104
Mean of logged Data	0.631	SD of logged Data	0.903

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	3.399	d2max (for USL)	1.938

Normal GOF Test			
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.249	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	7.1	90% Percentile (z)	4.173
95% UPL (t)	5.273	95% Percentile (z)	4.675
95% USL	5.081	99% Percentile (z)	5.617

Gamma GOF Test			
A-D Test Statistic	0.607	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.714	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.327	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.315	Data Not Gamma Distributed at 5% Significance Level	
Detected data follow Appr. Gamma Distribution at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	2.196	k star (bias corrected MLE)	1.35
Theta hat (MLE)	1.093	Theta star (bias corrected MLE)	1.778
nu hat (MLE)	30.75	nu star (bias corrected)	18.9
MLE Mean (bias corrected)	2.401	MLE Sd (bias corrected)	2.067

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	7.374	90% Percentile	5.135
95% Hawkins Wixley (HW) Approx. Gamma UPL	8.05	95% Percentile	6.481
95% WH Approx. Gamma UTL with 95% Coverage	13.35	99% Percentile	9.544
95% HW Approx. Gamma UTL with 95% Coverage	15.88		
95% WH USL	6.876	95% HW USL	7.441

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.803	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.338	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.304	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	40.54	90% Percentile (z)	5.985
95% UPL (t)	12.28	95% Percentile (z)	8.311
95% USL	10.83	99% Percentile (z)	15.38

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	7	95% UTL with 95% Coverage	4.7
Approx, f used to compute achieved CC	0.368	Approximate Actual Confidence Coefficient achieved by U	0.302
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	4.7	95% BCA Bootstrap UTL with 95% Coverage	4.7
95% UPL	4.7	90% Percentile	3.548
90% Chebyshev UPL	6.835	95% Percentile	4.124
95% Chebyshev UPL	8.843	99% Percentile	4.585
95% USL	4.7		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Barium|mg/kg

General Statistics			
Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	4
Minimum	5.9	First Quartile	12.25
Second Largest	21.5	Median	16.9

Maximum	22.2	Third Quartile	20.3
Mean	15.73	SD	5.994
Coefficient of Variation	0.381	Skewness	-0.652
Mean of logged Data	2.673	SD of logged Data	0.475

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.399	d2max (for USL)	1.938

Normal GOF Test

Shapiro Wilk Test Statistic	0.939	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.149	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	36.1	90% Percentile (z)	23.41
95% UPL (t)	28.18	95% Percentile (z)	25.59
95% USL	27.35	99% Percentile (z)	29.67

Gamma GOF Test

A-D Test Statistic	0.368	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.71	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.195	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.313	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.194	k star (bias corrected MLE)	3.634
Theta hat (MLE)	2.54	Theta star (bias corrected MLE)	4.328
nu hat (MLE)	86.71	nu star (bias corrected)	50.88
MLE Mean (bias corrected)	15.73	MLE Sd (bias corrected)	8.25

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	33.23	90% Percentile	26.79
95% Hawkins Wixley (HW) Approx. Gamma UPL	34.31	95% Percentile	31.28
95% WH Approx. Gamma UTL with 95% Coverage	50.4	99% Percentile	40.93
95% HW Approx. Gamma UTL with 95% Coverage	54.08		
95% WH USL	31.69	95% HW USL	32.6

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.874	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.199	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	72.84	90% Percentile (z)	26.62
95% UPL (t)	38.86	95% Percentile (z)	31.64
95% USL	36.37	99% Percentile (z)	43.75

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	7	95% UTL with 95% Coverage	22.2
Approx, f used to compute achieved CC	0.368	Approximate Actual Confidence Coefficient achieved by U	0.302

		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	22.2	95% BCA Bootstrap UTL with 95% Coverage	22.2
95% UPL	22.2	90% Percentile	21.78
90% Chebyshev UPL	34.95	95% Percentile	21.99
95% Chebyshev UPL	43.66	99% Percentile	22.16
95% USL	22.2		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Chromium|mg/kg

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	4
Minimum	5.1	First Quartile	5.77
Second Largest	10.3	Median	9.3
Maximum	10.8	Third Quartile	10.03
Mean	8.114	SD	2.465
Coefficient of Variation	0.304	Skewness	-0.298
Mean of logged Data	2.05	SD of logged Data	0.326

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.399	d2max (for USL)	1.938

Normal GOF Test

Shapiro Wilk Test Statistic	0.843	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.256	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	16.49	90% Percentile (z)	11.27
95% UPL (t)	13.23	95% Percentile (z)	12.17
95% USL	12.89	99% Percentile (z)	13.85

Gamma GOF Test

A-D Test Statistic	0.641	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.708	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.288	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.312	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	11.64	k star (bias corrected MLE)	6.748
Theta hat (MLE)	0.697	Theta star (bias corrected MLE)	1.202
nu hat (MLE)	163	nu star (bias corrected)	94.47
MLE Mean (bias corrected)	8.114	MLE Sd (bias corrected)	3.124

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	14.37	90% Percentile	12.29
95% Hawkins Wixley (HW) Approx. Gamma UPL	14.57	95% Percentile	13.84
95% WH Approx. Gamma UTL with 95% Coverage	19.95	99% Percentile	17.08
95% HW Approx. Gamma UTL with 95% Coverage	20.65		

95% WH USL	13.86	95% HW USL	14.02

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.832	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.281	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	23.52	90% Percentile (z)	11.8
95% UPL (t)	15.29	95% Percentile (z)	13.28
95% USL	14.61	99% Percentile (z)	16.58

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	7	95% UTL with 95% Coverage	10.8
Approx, f used to compute achieved CC	0.368	Approximate Actual Confidence Coefficient achieved by U	0.302
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	10.8	95% BCA Bootstrap UTL with 95% Coverage	10.8
95% UPL	10.8	90% Percentile	10.5
90% Chebyshev UPL	16.02	95% Percentile	10.65
95% Chebyshev UPL	19.6	99% Percentile	10.77
95% USL	10.8		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Cobalt|mg/kg

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6
Minimum	2.08	First Quartile	2.48
Second Largest	2.96	Median	2.63
Maximum	3.15	Third Quartile	2.96
Mean	2.66	SD	0.418
Coefficient of Variation	0.157	Skewness	-0.321
Mean of logged Data	0.968	SD of logged Data	0.162

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	4.203	d2max (for USL)	1.671

Normal GOF Test

Shapiro Wilk Test Statistic	0.977	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.163	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	4.418	90% Percentile (z)	3.196
95% UPL (t)	3.637	95% Percentile (z)	3.348

95% USL	3.359	99% Percentile (z)	3.633

Gamma GOF Test

A-D Test Statistic	0.213	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.678	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.19	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	48.78	k star (bias corrected MLE)	19.64
Theta hat (MLE)	0.0545	Theta star (bias corrected MLE)	0.135
nu hat (MLE)	487.8	nu star (bias corrected)	196.4
MLE Mean (bias corrected)	2.66	MLE Sd (bias corrected)	0.6

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	3.761	90% Percentile	3.452
95% Hawkins Wixley (HW) Approx. Gamma UPL	3.78	95% Percentile	3.718
95% WH Approx. Gamma UTL with 95% Coverage	4.855	99% Percentile	4.251
95% HW Approx. Gamma UTL with 95% Coverage	4.93		
95% WH USL	3.416	95% HW USL	3.424

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.966	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.165	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	5.202	90% Percentile (z)	3.24
95% UPL (t)	3.844	95% Percentile (z)	3.437
95% USL	3.452	99% Percentile (z)	3.838

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	5	95% UTL with 95% Coverage	3.15
Approx, f used to compute achieved CC	0.263	Approximate Actual Confidence Coefficient achieved by U	0.226
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	3.15	95% BCA Bootstrap UTL with 95% Coverage	3.15
95% UPL	3.15	90% Percentile	3.074
90% Chebyshev UPL	4.035	95% Percentile	3.112
95% Chebyshev UPL	4.657	99% Percentile	3.142
95% USL	3.15		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Iron|mg/kg

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6

Minimum	8370	First Quartile	8780
Second Largest	9420	Median	9020
Maximum	9610	Third Quartile	9420
Mean	9040	SD	496.5
Coefficient of Variation	0.0549	Skewness	-0.266
Mean of logged Data	9.108	SD of logged Data	0.0553

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	4.203	d2max (for USL)	1.671

Normal GOF Test

Shapiro Wilk Test Statistic	0.971	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.178	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	11127	90% Percentile (z)	9676
95% UPL (t)	10200	95% Percentile (z)	9857
95% USL	9870	99% Percentile (z)	10195

Gamma GOF Test

A-D Test Statistic	0.213	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.678	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.204	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	411.2	k star (bias corrected MLE)	164.6
Theta hat (MLE)	21.98	Theta star (bias corrected MLE)	54.91
nu hat (MLE)	4112	nu star (bias corrected)	1646
MLE Mean (bias corrected)	9040	MLE Sd (bias corrected)	704.6

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	10247	90% Percentile	9954
95% Hawkins Wixley (HW) Approx. Gamma UPL	10253	95% Percentile	10229
95% WH Approx. Gamma UTL with 95% Coverage	11292	99% Percentile	10759
95% HW Approx. Gamma UTL with 95% Coverage	11316		
95% WH USL	9891	95% HW USL	9894

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.969	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.179	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	11389	90% Percentile (z)	9692
95% UPL (t)	10273	95% Percentile (z)	9888
95% USL	9903	99% Percentile (z)	10268

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	5	95% UTL with 95% Coverage	9610
Approx, f used to compute achieved CC	0.263	Approximate Actual Confidence Coefficient achieved by U	0.226
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	9610	95% BCA Bootstrap UTL with 95% Coverage	9610
95% UPL	9610	90% Percentile	9534
90% Chebyshev UPL	10672	95% Percentile	9572
95% Chebyshev UPL	11411	99% Percentile	9602
95% USL	9610		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Manganese|mg/kg

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6
Minimum	75.2	First Quartile	97.8
Second Largest	122	Median	106
Maximum	127	Third Quartile	122
Mean	105.6	SD	20.69
Coefficient of Variation	0.196	Skewness	-0.676
Mean of logged Data	4.643	SD of logged Data	0.209

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	4.203	d2max (for USL)	1.671

Normal GOF Test

Shapiro Wilk Test Statistic	0.947	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.186	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	192.6	90% Percentile (z)	132.1
95% UPL (t)	153.9	95% Percentile (z)	139.6
95% USL	140.2	99% Percentile (z)	153.7

Gamma GOF Test

A-D Test Statistic	0.284	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.208	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	30.08	k star (bias corrected MLE)	12.17
Theta hat (MLE)	3.51	Theta star (bias corrected MLE)	8.68
nu hat (MLE)	300.8	nu star (bias corrected)	121.7
MLE Mean (bias corrected)	105.6	MLE Sd (bias corrected)	30.28

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	162.7	90% Percentile	145.8
95% Hawkins Wixley (HW) Approx. Gamma UPL	164.2	95% Percentile	159.8

95% WH Approx. Gamma UTL with 95% Coverage	222.5	99% Percentile	188.5
95% HW Approx. Gamma UTL with 95% Coverage	228.2		
95% WH USL	144.4	95% HW USL	145.1

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.924	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.187	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	249.9	90% Percentile (z)	135.7
95% UPL (t)	169.2	95% Percentile (z)	146.4
95% USL	147.3	99% Percentile (z)	168.9

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	5	95% UTL with 95% Coverage	127
Approx, f used to compute achieved CC	0.263	Approximate Actual Confidence Coefficient achieved by U	0.226
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	127	95% BCA Bootstrap UTL with 95% Coverage	127
95% UPL	127	90% Percentile	125
90% Chebyshev UPL	173.6	95% Percentile	126
95% Chebyshev UPL	204.4	99% Percentile	126.8
95% USL	127		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Mercury|mg/kg

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	4
Minimum	0.01	First Quartile	0.0291
Second Largest	0.041	Median	0.038
Maximum	0.053	Third Quartile	0.0405
Mean	0.0343	SD	0.0135
Coefficient of Variation	0.393	Skewness	-0.725
Mean of logged Data	-3.472	SD of logged Data	0.542

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.399	d2max (for USL)	1.938

Normal GOF Test

Shapiro Wilk Test Statistic	0.948	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.18	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.0801	90% Percentile (z)	0.0516
95% UPL (t)	0.0623	95% Percentile (z)	0.0565
95% USL	0.0604	99% Percentile (z)	0.0656

Gamma GOF Test

A-D Test Statistic	0.528	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.71	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.24	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.313	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.187	k star (bias corrected MLE)	3.059
Theta hat (MLE)	0.00661	Theta star (bias corrected MLE)	0.0112
nu hat (MLE)	72.62	nu star (bias corrected)	42.83
MLE Mean (bias corrected)	0.0343	MLE Sd (bias corrected)	0.0196

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0766	90% Percentile	0.0606
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.08	95% Percentile	0.0716
95% WH Approx. Gamma UTL with 95% Coverage	0.119	99% Percentile	0.0954
95% HW Approx. Gamma UTL with 95% Coverage	0.131		
95% WH USL	0.0728	95% HW USL	0.0757

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.81	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.281	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.196	90% Percentile (z)	0.0622
95% UPL (t)	0.0958	95% Percentile (z)	0.0757
95% USL	0.0888	99% Percentile (z)	0.11

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	7	95% UTL with 95% Coverage	0.053
Approx, f used to compute achieved CC	0.368	Approximate Actual Confidence Coefficient achieved by U	0.302
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.053	95% BCA Bootstrap UTL with 95% Coverage	0.053
95% UPL	0.053	90% Percentile	0.0458
90% Chebyshev UPL	0.0775	95% Percentile	0.0494
95% Chebyshev UPL	0.0971	99% Percentile	0.0523
95% USL	0.053		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Nickel|mg/kg

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6
Minimum	4.16	First Quartile	6
Second Largest	7.06	Median	6.47
Maximum	7.3	Third Quartile	7.06
Mean	6.198	SD	1.247
Coefficient of Variation	0.201	Skewness	-1.39
Mean of logged Data	1.805	SD of logged Data	0.226

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	4.203	d2max (for USL)	1.671

Normal GOF Test

Shapiro Wilk Test Statistic	0.882	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.237	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	11.44	90% Percentile (z)	7.797
95% UPL (t)	9.111	95% Percentile (z)	8.25
95% USL	8.283	99% Percentile (z)	9.1

Gamma GOF Test

A-D Test Statistic	0.464	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.259	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	26.66	k star (bias corrected MLE)	10.8
Theta hat (MLE)	0.232	Theta star (bias corrected MLE)	0.574
nu hat (MLE)	266.6	nu star (bias corrected)	108
MLE Mean (bias corrected)	6.198	MLE Sd (bias corrected)	1.886

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	9.787	90% Percentile	8.705
95% Hawkins Wixley (HW) Approx. Gamma UPL	9.901	95% Percentile	9.591
95% WH Approx. Gamma UTL with 95% Coverage	13.6	99% Percentile	11.41
95% HW Approx. Gamma UTL with 95% Coverage	14.02		
95% WH USL	8.628	95% HW USL	8.683

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.837	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.276	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	15.71	90% Percentile (z)	8.123
95% UPL (t)	10.3	95% Percentile (z)	8.817
95% USL	8.87	99% Percentile (z)	10.28

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	5	95% UTL with 95% Coverage	7.3
Approx, f used to compute achieved CC	0.263	Approximate Actual Confidence Coefficient achieved by U	0.226
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	7.3	95% BCA Bootstrap UTL with 95% Coverage	7.3
95% UPL	7.3	90% Percentile	7.204
90% Chebyshev UPL	10.3	95% Percentile	7.252
95% Chebyshev UPL	12.15	99% Percentile	7.29
95% USL	7.3		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Thallium|mg/kg

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6
Minimum	0.0751	First Quartile	0.092
Second Largest	0.11	Median	0.101
Maximum	0.12	Third Quartile	0.11
Mean	0.0996	SD	0.0172
Coefficient of Variation	0.173	Skewness	-0.458
Mean of logged Data	-2.319	SD of logged Data	0.18

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	4.203	d2max (for USL)	1.671

Normal GOF Test

Shapiro Wilk Test Statistic	0.987	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.132	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.172	90% Percentile (z)	0.122
95% UPL (t)	0.14	95% Percentile (z)	0.128
95% USL	0.128	99% Percentile (z)	0.14

Gamma GOF Test

A-D Test Statistic	0.204	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.678	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.156	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	39.78	k star (bias corrected MLE)	16.04
Theta hat (MLE)	0.0025	Theta star (bias corrected MLE)	0.00621
nu hat (MLE)	397.8	nu star (bias corrected)	160.4
MLE Mean (bias corrected)	0.0996	MLE Sd (bias corrected)	0.0249

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.146	90% Percentile	0.133
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.147	95% Percentile	0.144
95% WH Approx. Gamma UTL with 95% Coverage	0.193	99% Percentile	0.166
95% HW Approx. Gamma UTL with 95% Coverage	0.196		
95% WH USL	0.131	95% HW USL	0.132

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.967	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.158	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.21	90% Percentile (z)	0.124
95% UPL (t)	0.15	95% Percentile (z)	0.132
95% USL	0.133	99% Percentile (z)	0.15

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	5	95% UTL with 95% Coverage	0.12
Approx, f used to compute achieved CC	0.263	Approximate Actual Confidence Coefficient achieved by U	0.226
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.12	95% BCA Bootstrap UTL with 95% Coverage	0.12
95% UPL	0.12	90% Percentile	0.116
90% Chebyshev UPL	0.156	95% Percentile	0.118
95% Chebyshev UPL	0.182	99% Percentile	0.12
95% USL	0.12		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Vanadium|mg/kg

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6
Minimum	8.9	First Quartile	11.9
Second Largest	13.5	Median	12.9
Maximum	14.2	Third Quartile	13.5
Mean	12.28	SD	2.069
Coefficient of Variation	0.169	Skewness	-1.389
Mean of logged Data	2.495	SD of logged Data	0.185

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	4.203	d2max (for USL)	1.671

Normal GOF Test

Shapiro Wilk Test Statistic	0.892	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.227	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	20.98	90% Percentile (z)	14.93
95% UPL (t)	17.11	95% Percentile (z)	15.68
95% USL	15.74	99% Percentile (z)	17.09

Gamma GOF Test

A-D Test Statistic	0.441	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.678	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.243	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	39.16	k star (bias corrected MLE)	15.8
Theta hat (MLE)	0.314	Theta star (bias corrected MLE)	0.777
nu hat (MLE)	391.6	nu star (bias corrected)	158
MLE Mean (bias corrected)	12.28	MLE Sd (bias corrected)	3.09

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	18.02	90% Percentile	16.37
95% Hawkins Wixley (HW) Approx. Gamma UPL	18.16	95% Percentile	17.76
95% WH Approx. Gamma UTL with 95% Coverage	23.84	99% Percentile	20.58
95% HW Approx. Gamma UTL with 95% Coverage	24.37		
95% WH USL	16.2	95% HW USL	16.27

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.853	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.26	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	26.34	90% Percentile (z)	15.36
95% UPL (t)	18.66	95% Percentile (z)	16.42
95% USL	16.51	99% Percentile (z)	18.63

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	5	95% UTL with 95% Coverage	14.2
Approx, f used to compute achieved CC	0.263	Approximate Actual Confidence Coefficient achieved by U	0.226
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	14.2	95% BCA Bootstrap UTL with 95% Coverage	14.2
95% UPL	14.2	90% Percentile	13.92
90% Chebyshev UPL	19.08	95% Percentile	14.06
95% Chebyshev UPL	22.16	99% Percentile	14.17
95% USL	14.2		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Zinc|mg/kg

General Statistics			
Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6
Minimum	39.5	First Quartile	44.2
Second Largest	47.3	Median	46.8
Maximum	60.1	Third Quartile	47.3
Mean	47.58	SD	7.651
Coefficient of Variation	0.161	Skewness	1.299
Mean of logged Data	3.853	SD of logged Data	0.154

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	4.203	d2max (for USL)	1.671

Normal GOF Test			
Shapiro Wilk Test Statistic	0.89	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.315	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	79.74	90% Percentile (z)	57.39
95% UPL (t)	65.45	95% Percentile (z)	60.16
95% USL	60.37	99% Percentile (z)	65.38

Gamma GOF Test			
A-D Test Statistic	0.375	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.678	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.298	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	51.57	k star (bias corrected MLE)	20.76
Theta hat (MLE)	0.923	Theta star (bias corrected MLE)	2.292
nu hat (MLE)	515.7	nu star (bias corrected)	207.6
MLE Mean (bias corrected)	47.58	MLE Sd (bias corrected)	10.44

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	66.67	90% Percentile	61.36
95% Hawkins Wixley (HW) Approx. Gamma UPL	66.86	95% Percentile	65.96
95% WH Approx. Gamma UTL with 95% Coverage	85.54	99% Percentile	75.18
95% HW Approx. Gamma UTL with 95% Coverage	86.51		
95% WH USL	60.7	95% HW USL	60.75

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.29	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	89.89	90% Percentile (z)	57.38
95% UPL (t)	67.46	95% Percentile (z)	60.67
95% USL	60.92	99% Percentile (z)	67.37

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	5	95% UTL with 95% Coverage	60.1
Approx, f used to compute achieved CC	0.263	Approximate Actual Confidence Coefficient achieved by U	0.226
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	60.1	95% BCA Bootstrap UTL with 95% Coverage	60.1
95% UPL	60.1	90% Percentile	54.98
90% Chebyshev UPL	72.72	95% Percentile	57.54
95% Chebyshev UPL	84.11	99% Percentile	59.59
95% USL	60.1		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Anthracene|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	5
Minimum	0.0088	First Quartile	0.0713
Second Largest	0.18	Median	0.14
Maximum	0.256	Third Quartile	0.175
Mean	0.13	SD	0.0891
Coefficient of Variation	0.686	Skewness	-0.0199
Mean of logged Data	-2.444	SD of logged Data	1.235

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.983	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.133	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.46	90% Percentile (z)	0.244
95% UPL (t)	0.324	95% Percentile (z)	0.277
95% USL	0.292	99% Percentile (z)	0.337

Gamma GOF Test

A-D Test Statistic	0.372	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.71	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.244	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.338	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.382	k star (bias corrected MLE)	0.802
Theta hat (MLE)	0.094	Theta star (bias corrected MLE)	0.162
nu hat (MLE)	16.59	nu star (bias corrected)	9.627
MLE Mean (bias corrected)	0.13	MLE Sd (bias corrected)	0.145

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.525	90% Percentile	0.316
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.603	95% Percentile	0.421
95% WH Approx. Gamma UTL with 95% Coverage	1.137	99% Percentile	0.67
95% HW Approx. Gamma UTL with 95% Coverage	1.495		
95% WH USL	0.425	95% HW USL	0.473

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.836	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.27	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	8.465	90% Percentile (z)	0.423
95% UPL (t)	1.277	95% Percentile (z)	0.662
95% USL	0.824	99% Percentile (z)	1.536

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	0.256
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.256	95% BCA Bootstrap UTL with 95% Coverage	0.256
95% UPL	0.256	90% Percentile	0.218
90% Chebyshev UPL	0.419	95% Percentile	0.237
95% Chebyshev UPL	0.549	99% Percentile	0.252
95% USL	0.256		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Benzo(a)anthracene|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	5
		Number of Missing Observations	5
Minimum	0.12	First Quartile	1.15
Second Largest	2.3	Median	1.8
Maximum	2.64	Third Quartile	2.3
Mean	1.627	SD	0.958
Coefficient of Variation	0.589	Skewness	-0.666
Mean of logged Data	0.146	SD of logged Data	1.164

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.911	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.259	Lilliefors GOF Test	

5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	5.179	90% Percentile (z)	2.854
95% UPL (t)	3.712	95% Percentile (z)	3.202
95% USL	3.372	99% Percentile (z)	3.855

Gamma GOF Test

A-D Test Statistic	0.618	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.707	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.266	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.613	k star (bias corrected MLE)	0.918
Theta hat (MLE)	1.008	Theta star (bias corrected MLE)	1.772
nu hat (MLE)	19.36	nu star (bias corrected)	11.01
MLE Mean (bias corrected)	1.627	MLE Sd (bias corrected)	1.698

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	6.105	90% Percentile	3.825
95% Hawkins Wixley (HW) Approx. Gamma UPL	7.009	95% Percentile	5.024
95% WH Approx. Gamma UTL with 95% Coverage	12.73	99% Percentile	7.824
95% HW Approx. Gamma UTL with 95% Coverage	16.63		
95% WH USL	5.002	95% HW USL	5.571

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.744	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.316	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	86.68	90% Percentile (z)	5.143
95% UPL (t)	14.58	95% Percentile (z)	7.85
95% USL	9.649	99% Percentile (z)	17.35

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	2.64
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	2.64	95% BCA Bootstrap UTL with 95% Coverage	2.64
95% UPL	2.64	90% Percentile	2.47
90% Chebyshev UPL	4.731	95% Percentile	2.555
95% Chebyshev UPL	6.137	99% Percentile	2.623
95% USL	2.64		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Benzo(a)Pyrene|mg/kg

General Statistics			
Total Number of Observations	6	Number of Distinct Observations	5
		Number of Missing Observations	5
Minimum	0.2	First Quartile	1.9
Second Largest	3.9	Median	2.645
Maximum	4.3	Third Quartile	3.773
Mean	2.598	SD	1.546
Coefficient of Variation	0.595	Skewness	-0.556
Mean of logged Data	0.619	SD of logged Data	1.148

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test		
Shapiro Wilk Test Statistic	0.927	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.196	Lilliefors GOF Test
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level
Data appear Normal at 5% Significance Level		

Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	8.329	90% Percentile (z)	4.579
95% UPL (t)	5.962	95% Percentile (z)	5.141
95% USL	5.415	99% Percentile (z)	6.194

Gamma GOF Test		
A-D Test Statistic	0.581	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.707	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.289	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	1.636	k star (bias corrected MLE)	0.929
Theta hat (MLE)	1.588	Theta star (bias corrected MLE)	2.797
nu hat (MLE)	19.63	nu star (bias corrected)	11.15
MLE Mean (bias corrected)	2.598	MLE Sd (bias corrected)	2.696

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	9.692	90% Percentile	6.092
95% Hawkins Wixley (HW) Approx. Gamma UPL	11.09	95% Percentile	7.99
95% WH Approx. Gamma UTL with 95% Coverage	20.16	99% Percentile	12.42
95% HW Approx. Gamma UTL with 95% Coverage	26.19		
95% WH USL	7.947	95% HW USL	8.826

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.752	Shapiro Wilk Lognormal GOF Test
5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.341	Lilliefors Lognormal GOF Test
5% Lilliefors Critical Value	0.325	Data Not Lognormal at 5% Significance Level
Data Not Lognormal at 5% Significance Level		

Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	130.9	90% Percentile (z)	8.083
95% UPL (t)	22.57	95% Percentile (z)	12.26

95% USL	15.03	99% Percentile (z)	26.81

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	4.3
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	4.3	95% BCA Bootstrap UTL with 95% Coverage	4.3
95% UPL	4.3	90% Percentile	4.1
90% Chebyshev UPL	7.607	95% Percentile	4.2
95% Chebyshev UPL	9.875	99% Percentile	4.28
95% USL	4.3		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Benzo(b)fluoranthene|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	5
Minimum	0.38	First Quartile	4.075
Second Largest	6.6	Median	5.38
Maximum	7.2	Third Quartile	6.415
Mean	4.79	SD	2.477
Coefficient of Variation	0.517	Skewness	-1.295
Mean of logged Data	1.264	SD of logged Data	1.117

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.901	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.184	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	13.97	90% Percentile (z)	7.964
95% UPL (t)	10.18	95% Percentile (z)	8.864
95% USL	9.303	99% Percentile (z)	10.55

Gamma GOF Test

A-D Test Statistic	0.808	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.706	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.316	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.336	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.803	k star (bias corrected MLE)	1.013
Theta hat (MLE)	2.656	Theta star (bias corrected MLE)	4.73

nu hat (MLE)	21.64	nu star (bias corrected)	12.15
MLE Mean (bias corrected)	4.79	MLE Sd (bias corrected)	4.76

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	17.06	90% Percentile	11
95% Hawkins Wixley (HW) Approx. Gamma UPL	19.6	95% Percentile	14.29
95% WH Approx. Gamma UTL with 95% Coverage	34.68	99% Percentile	21.92
95% HW Approx. Gamma UTL with 95% Coverage	45.13		
95% WH USL	14.1	95% HW USL	15.72

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.682	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.359	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	222.7	90% Percentile (z)	14.82
95% UPL (t)	40.26	95% Percentile (z)	22.23
95% USL	27.1	99% Percentile (z)	47.59

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	7.2
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	7.2	95% BCA Bootstrap UTL with 95% Coverage	7.2
95% UPL	7.2	90% Percentile	6.9
90% Chebyshev UPL	12.82	95% Percentile	7.05
95% Chebyshev UPL	16.45	99% Percentile	7.17
95% USL	7.2		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Benzo(g,h,i)Perylene|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	5
Minimum	0.17	First Quartile	1.45
Second Largest	2.5	Median	2
Maximum	3	Third Quartile	2.4
Mean	1.828	SD	0.993
Coefficient of Variation	0.543	Skewness	-0.85
Mean of logged Data	0.315	SD of logged Data	1.06

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.958	Shapiro Wilk GOF Test	

5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.195	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	5.511	90% Percentile (z)	3.101
95% UPL (t)	3.99	95% Percentile (z)	3.462
95% USL	3.638	99% Percentile (z)	4.139

Gamma GOF Test

A-D Test Statistic	0.622	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.705	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.284	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.336	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.882	k star (bias corrected MLE)	1.052
Theta hat (MLE)	0.971	Theta star (bias corrected MLE)	1.738
nu hat (MLE)	22.59	nu star (bias corrected)	12.63
MLE Mean (bias corrected)	1.828	MLE Sd (bias corrected)	1.782

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	6.4	90% Percentile	4.157
95% Hawkins Wixley (HW) Approx. Gamma UPL	7.258	95% Percentile	5.38
95% WH Approx. Gamma UTL with 95% Coverage	12.92	99% Percentile	8.207
95% HW Approx. Gamma UTL with 95% Coverage	16.49		
95% WH USL	5.298	95% HW USL	5.845

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.739	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.314	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	69.9	90% Percentile (z)	5.333
95% UPL (t)	13.78	95% Percentile (z)	7.839
95% USL	9.461	99% Percentile (z)	16.15

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	3
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	3	95% BCA Bootstrap UTL with 95% Coverage	3
95% UPL	3	90% Percentile	2.75
90% Chebyshev UPL	5.047	95% Percentile	2.875
95% Chebyshev UPL	6.504	99% Percentile	2.975
95% USL	3		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Benzo(k)Fluoranthene|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	5
		Number of Missing Observations	5
Minimum	0.13	First Quartile	1.3
Second Largest	2.5	Median	1.64
Maximum	2.6	Third Quartile	2.37
Mean	1.635	SD	0.926
Coefficient of Variation	0.566	Skewness	-0.717
Mean of logged Data	0.173	SD of logged Data	1.126

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.919	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.192	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	5.069	90% Percentile (z)	2.822
95% UPL (t)	3.651	95% Percentile (z)	3.158
95% USL	3.322	99% Percentile (z)	3.789

Gamma GOF Test

A-D Test Statistic	0.646	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.706	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.322	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.718	k star (bias corrected MLE)	0.97
Theta hat (MLE)	0.952	Theta star (bias corrected MLE)	1.685
nu hat (MLE)	20.62	nu star (bias corrected)	11.64
MLE Mean (bias corrected)	1.635	MLE Sd (bias corrected)	1.66

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	5.959	90% Percentile	3.793
95% Hawkins Wixley (HW) Approx. Gamma UPL	6.818	95% Percentile	4.951
95% WH Approx. Gamma UTL with 95% Coverage	12.26	99% Percentile	7.645
95% HW Approx. Gamma UTL with 95% Coverage	15.89		
95% WH USL	4.904	95% HW USL	5.449

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.727	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.365	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	77.36	90% Percentile (z)	5.034
95% UPL (t)	13.79	95% Percentile (z)	7.579
95% USL	9.253	99% Percentile (z)	16.32

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	2.6
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	2.6	95% BCA Bootstrap UTL with 95% Coverage	2.6
95% UPL	2.6	90% Percentile	2.55
90% Chebyshev UPL	4.636	95% Percentile	2.575
95% Chebyshev UPL	5.995	99% Percentile	2.595
95% USL	2.6		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Chrysene|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	5
Minimum	0.24	First Quartile	2.425
Second Largest	4.32	Median	3.4
Maximum	4.7	Third Quartile	4.315
Mean	3.077	SD	1.704
Coefficient of Variation	0.554	Skewness	-0.928
Mean of logged Data	0.806	SD of logged Data	1.132

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.875	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.264	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	9.394	90% Percentile (z)	5.26
95% UPL (t)	6.785	95% Percentile (z)	5.879
95% USL	6.181	99% Percentile (z)	7.04

Gamma GOF Test

A-D Test Statistic	0.748	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.706	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.313	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.719	k star (bias corrected MLE)	0.971
Theta hat (MLE)	1.789	Theta star (bias corrected MLE)	3.169
nu hat (MLE)	20.63	nu star (bias corrected)	11.65
MLE Mean (bias corrected)	3.077	MLE Sd (bias corrected)	3.123

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	11.21	90% Percentile	7.136
95% Hawkins Wixley (HW) Approx. Gamma UPL	12.85	95% Percentile	9.314
95% WH Approx. Gamma UTL with 95% Coverage	23.04	99% Percentile	14.38
95% HW Approx. Gamma UTL with 95% Coverage	29.97		
95% WH USL	9.227	95% HW USL	10.27

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.705	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.358	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	149.1	90% Percentile (z)	9.553
95% UPL (t)	26.32	95% Percentile (z)	14.42
95% USL	17.62	99% Percentile (z)	31.19

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	4.7
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	4.7	95% BCA Bootstrap UTL with 95% Coverage	4.7
95% UPL	4.7	90% Percentile	4.51
90% Chebyshev UPL	8.598	95% Percentile	4.605
95% Chebyshev UPL	11.1	99% Percentile	4.681
95% USL	4.7		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Dibenzo(a,h)Anthracene|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	5
Minimum	0.042	First Quartile	0.238
Second Largest	0.54	Median	0.379
Maximum	0.66	Third Quartile	0.522
Mean	0.37	SD	0.228
Coefficient of Variation	0.615	Skewness	-0.227
Mean of logged Data	-1.286	SD of logged Data	1.009

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test			
Shapiro Wilk Test Statistic	0.976	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.167	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	1.214	90% Percentile (z)	0.662
95% UPL (t)	0.865	95% Percentile (z)	0.744
95% USL	0.785	99% Percentile (z)	0.9
Gamma GOF Test			
A-D Test Statistic	0.36	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.705	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.218	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.336	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.866	k star (bias corrected MLE)	1.044
Theta hat (MLE)	0.198	Theta star (bias corrected MLE)	0.354
nu hat (MLE)	22.39	nu star (bias corrected)	12.53
MLE Mean (bias corrected)	0.37	MLE Sd (bias corrected)	0.362
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	1.304	90% Percentile	0.843
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.452	95% Percentile	1.092
95% WH Approx. Gamma UTL with 95% Coverage	2.647	99% Percentile	1.667
95% HW Approx. Gamma UTL with 95% Coverage	3.296		
95% WH USL	1.077	95% HW USL	1.17
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.838	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.244	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	11.65	90% Percentile (z)	1.007
95% UPL (t)	2.484	95% Percentile (z)	1.453
95% USL	1.738	99% Percentile (z)	2.89
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	6	95% UTL with 95% Coverage	0.66
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.66	95% BCA Bootstrap UTL with 95% Coverage	0.66
95% UPL	0.66	90% Percentile	0.6
90% Chebyshev UPL	1.108	95% Percentile	0.63
95% Chebyshev UPL	1.442	99% Percentile	0.654
95% USL	0.66		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.

Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Fluoranthene|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	5
Minimum	0.37	First Quartile	3.95
Second Largest	7.7	Median	5.75
Maximum	8.47	Third Quartile	7.55
Mean	5.307	SD	3.047
Coefficient of Variation	0.574	Skewness	-0.778
Mean of logged Data	1.327	SD of logged Data	1.181

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.921	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.222	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	16.6	90% Percentile (z)	9.211
95% UPL (t)	11.94	95% Percentile (z)	10.32
95% USL	10.86	99% Percentile (z)	12.39

Gamma GOF Test

A-D Test Statistic	0.646	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.707	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.282	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.607	k star (bias corrected MLE)	0.915
Theta hat (MLE)	3.302	Theta star (bias corrected MLE)	5.801
nu hat (MLE)	19.29	nu star (bias corrected)	10.98
MLE Mean (bias corrected)	5.307	MLE Sd (bias corrected)	5.548

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	19.93	90% Percentile	12.49
95% Hawkins Wixley (HW) Approx. Gamma UPL	22.99	95% Percentile	16.41
95% WH Approx. Gamma UTL with 95% Coverage	41.56	99% Percentile	25.57
95% HW Approx. Gamma UTL with 95% Coverage	54.63		
95% WH USL	16.33	95% HW USL	18.27

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.728	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.336	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	301.1	90% Percentile (z)	17.13
95% UPL (t)	49.3	95% Percentile (z)	26.31
95% USL	32.44	99% Percentile (z)	58.85

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	8.47
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	8.47	95% BCA Bootstrap UTL with 95% Coverage	8.47
95% UPL	8.47	90% Percentile	8.085
90% Chebyshev UPL	15.18	95% Percentile	8.278
95% Chebyshev UPL	19.65	99% Percentile	8.432
95% USL	8.47		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Indeno(1,2,3-CD)Pyrene|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	5
Minimum	0.24	First Quartile	1.62
Second Largest	2.9	Median	2.19
Maximum	4.4	Third Quartile	2.85
Mean	2.253	SD	1.417
Coefficient of Variation	0.629	Skewness	0.171
Mean of logged Data	0.517	SD of logged Data	1.024

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.976	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.157	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	7.506	90% Percentile (z)	4.069
95% UPL (t)	5.337	95% Percentile (z)	4.584
95% USL	4.835	99% Percentile (z)	5.549

Gamma GOF Test

A-D Test Statistic	0.399	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.705	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.26	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.336	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics			
k hat (MLE)	1.841	k star (bias corrected MLE)	1.032
Theta hat (MLE)	1.224	Theta star (bias corrected MLE)	2.184
nu hat (MLE)	22.09	nu star (bias corrected)	12.38
MLE Mean (bias corrected)	2.253	MLE Sd (bias corrected)	2.219

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	7.974	90% Percentile	5.149
95% Hawkins Wixley (HW) Approx. Gamma UPL	8.902	95% Percentile	6.677
95% WH Approx. Gamma UTL with 95% Coverage	16.22	99% Percentile	10.22
95% HW Approx. Gamma UTL with 95% Coverage	20.28		
95% WH USL	6.585	95% HW USL	7.163

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.825	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.315	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	74.63	90% Percentile (z)	6.226
95% UPL (t)	15.56	95% Percentile (z)	9.03
95% USL	10.83	99% Percentile (z)	18.14

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	6	95% UTL with 95% Coverage	4.4
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	4.4	95% BCA Bootstrap UTL with 95% Coverage	4.4
95% UPL	4.4	90% Percentile	3.65
90% Chebyshev UPL	6.844	95% Percentile	4.025
95% Chebyshev UPL	8.923	99% Percentile	4.325
95% USL	4.4		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Phenanthrene|mg/kg

General Statistics			
Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	5
Minimum	0.15	First Quartile	1.175
Second Largest	2.35	Median	2
Maximum	2.4	Third Quartile	2.338
Mean	1.65	SD	0.911
Coefficient of Variation	0.552	Skewness	-1.035
Mean of logged Data	0.199	SD of logged Data	1.08

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.85	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.262	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	5.028	90% Percentile (z)	2.818
95% UPL (t)	3.633	95% Percentile (z)	3.149
95% USL	3.31	99% Percentile (z)	3.769

Gamma GOF Test

A-D Test Statistic	0.73	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.706	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.281	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.336	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.808	k star (bias corrected MLE)	1.015
Theta hat (MLE)	0.913	Theta star (bias corrected MLE)	1.626
nu hat (MLE)	21.69	nu star (bias corrected)	12.18
MLE Mean (bias corrected)	1.65	MLE Sd (bias corrected)	1.638

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	5.889	90% Percentile	3.785
95% Hawkins Wixley (HW) Approx. Gamma UPL	6.689	95% Percentile	4.917
95% WH Approx. Gamma UTL with 95% Coverage	12	99% Percentile	7.542
95% HW Approx. Gamma UTL with 95% Coverage	15.37		
95% WH USL	4.861	95% HW USL	5.368

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.72	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.287	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	66.96	90% Percentile (z)	4.872
95% UPL (t)	12.81	95% Percentile (z)	7.213
95% USL	8.735	99% Percentile (z)	15.06

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	2.4
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	2.4	95% BCA Bootstrap UTL with 95% Coverage	2.4
95% UPL	2.4	90% Percentile	2.375
90% Chebyshev UPL	4.602	95% Percentile	2.388
95% Chebyshev UPL	5.939	99% Percentile	2.398
95% USL	2.4		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Pyrene|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	5
Minimum	0.38	First Quartile	3.8
Second Largest	6.5	Median	5.095
Maximum	8.2	Third Quartile	6.323
Mean	4.812	SD	2.704
Coefficient of Variation	0.562	Skewness	-0.671
Mean of logged Data	1.255	SD of logged Data	1.126

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.973	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.16	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	14.84	90% Percentile (z)	8.277
95% UPL (t)	10.7	95% Percentile (z)	9.26
95% USL	9.739	99% Percentile (z)	11.1

Gamma GOF Test

A-D Test Statistic	0.603	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.706	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.293	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.727	k star (bias corrected MLE)	0.975
Theta hat (MLE)	2.785	Theta star (bias corrected MLE)	4.936
nu hat (MLE)	20.73	nu star (bias corrected)	11.7
MLE Mean (bias corrected)	4.812	MLE Sd (bias corrected)	4.873

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	17.49	90% Percentile	11.15
95% Hawkins Wixley (HW) Approx. Gamma UPL	20.02	95% Percentile	14.54
95% WH Approx. Gamma UTL with 95% Coverage	35.91	99% Percentile	22.44
95% HW Approx. Gamma UTL with 95% Coverage	46.6		
95% WH USL	14.4	95% HW USL	16.01

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.739	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.343	Lilliefors Lognormal GOF Test	

5% Lilliefors Critical Value	0.325	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	228.5	90% Percentile (z)	14.85
95% UPL (t)	40.7	95% Percentile (z)	22.36
95% USL	27.3	99% Percentile (z)	48.18

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	8.2
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	8.2	95% BCA Bootstrap UTL with 95% Coverage	8.2
95% UPL	8.2	90% Percentile	7.35
90% Chebyshev UPL	13.57	95% Percentile	7.775
95% Chebyshev UPL	17.54	99% Percentile	8.115
95% USL	8.2		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Total High MW PAHs|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	5
Minimum	2.3	First Quartile	23.25
Second Largest	39	Median	30
Maximum	45	Third Quartile	38.25
Mean	28.22	SD	15.33
Coefficient of Variation	0.543	Skewness	-0.93
Mean of logged Data	3.033	SD of logged Data	1.111

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.927	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	85.06	90% Percentile (z)	47.86
95% UPL (t)	61.58	95% Percentile (z)	53.43
95% USL	56.15	99% Percentile (z)	63.88

Gamma GOF Test

A-D Test Statistic	0.704	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.706	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.33	Kolmogorov-Smirnov Gamma GOF Test	

5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.78	k star (bias corrected MLE)	1.001
Theta hat (MLE)	15.86	Theta star (bias corrected MLE)	28.19
nu hat (MLE)	21.35	nu star (bias corrected)	12.01
MLE Mean (bias corrected)	28.22	MLE Sd (bias corrected)	28.2

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	101.2	90% Percentile	64.96
95% Hawkins Wixley (HW) Approx. Gamma UPL	115.8	95% Percentile	84.5
95% WH Approx. Gamma UTL with 95% Coverage	206.4	99% Percentile	129.9
95% HW Approx. Gamma UTL with 95% Coverage	267.3		
95% WH USL	83.49	95% HW USL	92.79

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.712	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.37	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1278	90% Percentile (z)	86.24
95% UPL (t)	233.1	95% Percentile (z)	129.1
95% USL	157.2	99% Percentile (z)	275.3

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	45
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	45	95% BCA Bootstrap UTL with 95% Coverage	45
95% UPL	45	90% Percentile	42
90% Chebyshev UPL	77.9	95% Percentile	43.5
95% Chebyshev UPL	100.4	99% Percentile	44.7
95% USL	45		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Total Low MW PAHs|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
		Number of Missing Observations	5
Minimum	0.2	First Quartile	1.325
Second Largest	2.8	Median	2.35
Maximum	3.8	Third Quartile	2.775
Mean	2.1	SD	1.293
Coefficient of Variation	0.616	Skewness	-0.331
Mean of logged Data	0.423	SD of logged Data	1.08

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.974	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.179	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	6.895	90% Percentile (z)	3.757
95% UPL (t)	4.914	95% Percentile (z)	4.227
95% USL	4.456	99% Percentile (z)	5.108

Gamma GOF Test

A-D Test Statistic	0.436	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.706	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.244	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.715	k star (bias corrected MLE)	0.968
Theta hat (MLE)	1.225	Theta star (bias corrected MLE)	2.169
nu hat (MLE)	20.57	nu star (bias corrected)	11.62
MLE Mean (bias corrected)	2.1	MLE Sd (bias corrected)	2.134

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	7.686	90% Percentile	4.874
95% Hawkins Wixley (HW) Approx. Gamma UPL	8.668	95% Percentile	6.363
95% WH Approx. Gamma UTL with 95% Coverage	15.87	99% Percentile	9.829
95% HW Approx. Gamma UTL with 95% Coverage	20.18		
95% WH USL	6.317	95% HW USL	6.93

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.816	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.265	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	83.84	90% Percentile (z)	6.094
95% UPL (t)	16.03	95% Percentile (z)	9.024
95% USL	10.93	99% Percentile (z)	18.84

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	3.8
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	3.8	95% BCA Bootstrap UTL with 95% Coverage	3.8
95% UPL	3.8	90% Percentile	3.3
90% Chebyshev UPL	6.29	95% Percentile	3.55

95% Chebyshev UPL	8.188	99% Percentile	3.75
95% USL	3.8		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Total PAHs|mg/kg

General Statistics

Total Number of Observations	6	Number of Distinct Observations	5
		Number of Missing Observations	5
Minimum	2.5	First Quartile	25
Second Largest	42	Median	32.5
Maximum	48	Third Quartile	41.5
Mean	30.42	SD	16.57
Coefficient of Variation	0.545	Skewness	-0.936
Mean of logged Data	3.109	SD of logged Data	1.109

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.91	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.218	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	91.87	90% Percentile (z)	51.65
95% UPL (t)	66.49	95% Percentile (z)	57.68
95% USL	60.61	99% Percentile (z)	68.97

Gamma GOF Test

A-D Test Statistic	0.724	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.706	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.334	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.781	k star (bias corrected MLE)	1.001
Theta hat (MLE)	17.08	Theta star (bias corrected MLE)	30.37
nu hat (MLE)	21.37	nu star (bias corrected)	12.02
MLE Mean (bias corrected)	30.42	MLE Sd (bias corrected)	30.4

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	109.1	90% Percentile	70.01
95% Hawkins Wixley (HW) Approx. Gamma UPL	124.7	95% Percentile	91.08
95% WH Approx. Gamma UTL with 95% Coverage	222.5	99% Percentile	140
95% HW Approx. Gamma UTL with 95% Coverage	287.9		
95% WH USL	89.99	95% HW USL	99.96

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.709	Shapiro Wilk Lognormal GOF Test	

5% Shapiro Wilk Critical Value	0.788	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.373	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.325	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1365	90% Percentile (z)	92.69
95% UPL (t)	250	95% Percentile (z)	138.7
95% USL	168.8	99% Percentile (z)	295.2

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	48
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	48	95% BCA Bootstrap UTL with 95% Coverage	48
95% UPL	48	90% Percentile	45
90% Chebyshev UPL	84.12	95% Percentile	46.5
95% Chebyshev UPL	108.4	99% Percentile	47.7
95% USL	48		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.19/24/2020 4:18:54 PM
From File	C:\Users\scesnyc\Desktop\DeskTop Folder\Blue Beach\Input\SD_Input.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

RA_SE_Metals|Copper|mg/kg

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6
Minimum	6.27	First Quartile	11.4
Second Largest	12.1	Median	11.8
Maximum	13.4	Third Quartile	12.1
Mean	10.99	SD	2.745
Coefficient of Variation	0.25	Skewness	-1.804
Mean of logged Data	2.365	SD of logged Data	0.302

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	4.203	d2max (for USL)	1.671

Normal GOF Test

Shapiro Wilk Test Statistic	0.799	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	

Lilliefors Test Statistic	0.359	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Data Not Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	22.53	90% Percentile (z)	14.51
95% UPL (t)	17.4	95% Percentile (z)	15.51
95% USL	15.58	99% Percentile (z)	17.38

Gamma GOF Test

A-D Test Statistic	0.747	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.679	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.39	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.357	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	15.71	k star (bias corrected MLE)	6.418
Theta hat (MLE)	0.7	Theta star (bias corrected MLE)	1.713
nu hat (MLE)	157.1	nu star (bias corrected)	64.18
MLE Mean (bias corrected)	10.99	MLE Sd (bias corrected)	4.34

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	19.61	90% Percentile	16.79
95% Hawkins Wixley (HW) Approx. Gamma UPL	20.01	95% Percentile	18.97
95% WH Approx. Gamma UTL with 95% Coverage	29.41	99% Percentile	23.51
95% HW Approx. Gamma UTL with 95% Coverage	30.96		
95% WH USL	16.73	95% HW USL	16.93

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.739	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.39	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.343	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	37.89	90% Percentile (z)	15.68
95% UPL (t)	21.55	95% Percentile (z)	17.5
95% USL	17.64	99% Percentile (z)	21.49

Nonparametric Distribution Free Background Statistics
Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	5	95% UTL with 95% Coverage	13.4
Approx, f used to compute achieved CC	0.263	Approximate Actual Confidence Coefficient achieved by U	0.226
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	13.4	95% BCA Bootstrap UTL with 95% Coverage	13.4
95% UPL	13.4	90% Percentile	12.88
90% Chebyshev UPL	20.02	95% Percentile	13.14
95% Chebyshev UPL	24.1	99% Percentile	13.35
95% USL	13.4		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data

represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Lead|mg/kg

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	4
Minimum	11.3	First Quartile	20.35
Second Largest	31.9	Median	28.2
Maximum	54.2	Third Quartile	30.15
Mean	27.81	SD	14.21
Coefficient of Variation	0.511	Skewness	0.858
Mean of logged Data	3.206	SD of logged Data	0.544

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.399	d2max (for USL)	1.938

Normal GOF Test

Shapiro Wilk Test Statistic	0.877	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.244	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	76.11	90% Percentile (z)	46.03
95% UPL (t)	57.33	95% Percentile (z)	51.19
95% USL	55.36	99% Percentile (z)	60.87

Gamma GOF Test

A-D Test Statistic	0.5	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.71	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.281	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.313	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.351	k star (bias corrected MLE)	2.582
Theta hat (MLE)	6.392	Theta star (bias corrected MLE)	10.77
nu hat (MLE)	60.92	nu star (bias corrected)	36.15
MLE Mean (bias corrected)	27.81	MLE Sd (bias corrected)	17.31

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	65.91	90% Percentile	51.01
95% Hawkins Wixley (HW) Approx. Gamma UPL	67.9	95% Percentile	60.99
95% WH Approx. Gamma UTL with 95% Coverage	105.9	99% Percentile	82.81
95% HW Approx. Gamma UTL with 95% Coverage	114		
95% WH USL	62.41	95% HW USL	64.03

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.888	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.803	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.303	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.304	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	157.1	90% Percentile (z)	49.6

95% UPL (t)	76.5	95% Percentile (z)	60.45
95% USL	70.92	99% Percentile (z)	87.61

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	7	95% UTL with 95% Coverage	54.2
Approx, f used to compute achieved CC	0.368	Approximate Actual Confidence Coefficient achieved by U	0.302
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	54.2	95% BCA Bootstrap UTL with 95% Coverage	54.2
95% UPL	54.2	90% Percentile	40.82
90% Chebyshev UPL	73.39	95% Percentile	47.51
95% Chebyshev UPL	94.03	99% Percentile	52.86
95% USL	54.2		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Beryllium|mg/kg (se-background_tidalstreamnorth)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	4
		Number of Missing Observations	2
Minimum	0.358	First Quartile	0.435
Second Largest	0.594	Median	0.56
Maximum	0.594	Third Quartile	0.594
Mean	0.508	SD	0.106
Coefficient of Variation	0.209	Skewness	-0.822
Mean of logged Data	-0.696	SD of logged Data	0.225

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	4.203	d2max (for USL)	1.671

Normal GOF Test

Shapiro Wilk Test Statistic	0.841	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.287	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.956	90% Percentile (z)	0.645
95% UPL (t)	0.757	95% Percentile (z)	0.683
95% USL	0.686	99% Percentile (z)	0.756

Gamma GOF Test

A-D Test Statistic	0.521	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.315	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	25.99	k star (bias corrected MLE)	10.53

Theta hat (MLE)	0.0196	Theta star (bias corrected MLE)	0.0483
nu hat (MLE)	259.9	nu star (bias corrected)	105.3
MLE Mean (bias corrected)	0.508	MLE Sd (bias corrected)	0.157

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.807	90% Percentile	0.716
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.815	95% Percentile	0.79
95% WH Approx. Gamma UTL with 95% Coverage	1.125	99% Percentile	0.941
95% HW Approx. Gamma UTL with 95% Coverage	1.157		
95% WH USL	0.71	95% HW USL	0.714

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.834	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.297	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.343	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.285	90% Percentile (z)	0.665
95% UPL (t)	0.844	95% Percentile (z)	0.722
95% USL	0.726	99% Percentile (z)	0.842

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	5	95% UTL with 95% Coverage	0.594
Approx, f used to compute achieved CC	0.263	Approximate Actual Confidence Coefficient achieved by U	0.226
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.594	95% BCA Bootstrap UTL with 95% Coverage	0.594
95% UPL	0.594	90% Percentile	0.594
90% Chebyshev UPL	0.858	95% Percentile	0.594
95% Chebyshev UPL	1.016	99% Percentile	0.594
95% USL	0.594		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/22/2020 12:26:19 PM
From File	SD_Input.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

RA_SE_Metals|Cadmium|mg/kg

General Statistics

Total Number of Observations	7	Number of Missing Observations	4
Number of Distinct Observations	7		
Number of Detects	5	Number of Non-Detects	2
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	0.025	Minimum Non-Detect	0.2
Maximum Detect	0.104	Maximum Non-Detect	0.4
Variance Detected	8.3165E-4	Percent Non-Detects	28.57%
Mean Detected	0.0586	SD Detected	0.0288
Mean of Detected Logged Data	-2.937	SD of Detected Logged Data	0.513

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.399	d2max (for USL)	1.938

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.932	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.251	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0586	KM SD	0.0258
95% UTL95% Coverage	0.146	95% KM UPL (t)	0.112
90% KM Percentile (z)	0.0917	95% KM Percentile (z)	0.101
99% KM Percentile (z)	0.119	95% KM USL	0.109

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0847	SD	0.0581
95% UTL95% Coverage	0.282	95% UPL (t)	0.205
90% Percentile (z)	0.159	95% Percentile (z)	0.18
99% Percentile (z)	0.22	95% USL	0.197

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.263	Anderson-Darling GOF Test	
5% A-D Critical Value	0.681	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.203	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	5.147	k star (bias corrected MLE)	2.192
Theta hat (MLE)	0.0114	Theta star (bias corrected MLE)	0.0267

nu hat (MLE)	51.47	nu star (bias corrected)	21.92
MLE Mean (bias corrected)	0.0586		
MLE Sd (bias corrected)	0.0396	95% Percentile of Chisquare (2kstar)	10.11

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.025	Mean	0.0579
Maximum	0.104	Median	0.0561
SD	0.0236	CV	0.407
k hat (MLE)	7.125	k star (bias corrected MLE)	4.167
Theta hat (MLE)	0.00813	Theta star (bias corrected MLE)	0.0139
nu hat (MLE)	99.75	nu star (bias corrected)	58.33
MLE Mean (bias corrected)	0.0579	MLE Sd (bias corrected)	0.0284
95% Percentile of Chisquare (2kstar)	15.98	90% Percentile	0.096
95% Percentile	0.111	99% Percentile	0.143

The following statistics are computed using Gamma ROS Statistics on Imputed Data
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.174	0.183	95% Approx. Gamma UPL	0.117	0.119
95% Gamma USL	0.112	0.114			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0586	SD (KM)	0.0258
Variance (KM)	6.6532E-4	SE of Mean (KM)	0.0129
k hat (KM)	5.168	k star (KM)	3.049
nu hat (KM)	72.36	nu star (KM)	42.68
theta hat (KM)	0.0113	theta star (KM)	0.0192
80% gamma percentile (KM)	0.0835	90% gamma percentile (KM)	0.104
95% gamma percentile (KM)	0.122	99% gamma percentile (KM)	0.163

The following statistics are computed using gamma distribution and KM estimates
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.189	0.2	95% Approx. Gamma UPL	0.124	0.127
95% KM Gamma Percentile	0.107	0.108	95% Gamma USL	0.118	0.12

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.961	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.239	Lilliefors GOF Test
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.057	Mean in Log Scale	-2.937
SD in Original Scale	0.0237	SD in Log Scale	0.418
95% UTL95% Coverage	0.22	95% BCA UTL95% Coverage	0.104
95% Bootstrap (%) UTL95% Coverage	0.104	95% UPL (t)	0.127
90% Percentile (z)	0.0907	95% Percentile (z)	0.106
99% Percentile (z)	0.14	95% USL	0.119

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-2.937	95% KM UTL (Lognormal)95% Coverage	0.252

KM SD of Logged Data	0.458	95% KM UPL (Lognormal)	0.137
95% KM Percentile Lognormal (z)	0.113	95% KM USL (Lognormal)	0.129

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0847	Mean in Log Scale	-2.656
SD in Original Scale	0.0581	SD in Log Scale	0.666
95% UTL95% Coverage	0.676	95% UPL (t)	0.28
90% Percentile (z)	0.165	95% Percentile (z)	0.21
99% Percentile (z)	0.331	95% USL	0.255

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	7	95% UTL with95% Coverage	0.4
Approx, f used to compute achieved CC	0.368	Approximate Actual Confidence Coefficient achieved by U	0.302
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.4
95% USL	0.4	95% KM Chebyshev UPL	0.179

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Silver|mg/kg

General Statistics

Total Number of Observations	7	Number of Missing Observations	4
Number of Distinct Observations	7		
Number of Detects	5	Number of Non-Detects	2
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	0.021	Minimum Non-Detect	0.2
Maximum Detect	0.057	Maximum Non-Detect	0.4
Variance Detected	2.0187E-4	Percent Non-Detects	28.57%
Mean Detected	0.0449	SD Detected	0.0142
Mean of Detected Logged Data	-3.159	SD of Detected Logged Data	0.405

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.399	d2max (for USL)	1.938

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.85	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.275	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0449	KM SD	0.0127
95% UTL95% Coverage	0.0881	95% KM UPL (t)	0.0713
90% KM Percentile (z)	0.0612	95% KM Percentile (z)	0.0658
99% KM Percentile (z)	0.0744	95% KM USL	0.0695

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0749	SD	0.06

95% UTL95% Coverage	0.279	95% UPL (t)	0.2
90% Percentile (z)	0.152	95% Percentile (z)	0.174
99% Percentile (z)	0.214	95% USL	0.191

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.616	Anderson-Darling GOF Test	
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.32	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	9.138	k star (bias corrected MLE)	3.789
Theta hat (MLE)	0.00491	Theta star (bias corrected MLE)	0.0118
nu hat (MLE)	91.38	nu star (bias corrected)	37.89
MLE Mean (bias corrected)	0.0449		
MLE Sd (bias corrected)	0.0231	95% Percentile of Chisquare (2kstar)	14.9

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.021	Mean	0.0446
Maximum	0.057	Median	0.044
SD	0.0116	CV	0.26
k hat (MLE)	12.72	k star (bias corrected MLE)	7.362
Theta hat (MLE)	0.00351	Theta star (bias corrected MLE)	0.00606
nu hat (MLE)	178	nu star (bias corrected)	103.1
MLE Mean (bias corrected)	0.0446	MLE Sd (bias corrected)	0.0165
95% Percentile of Chisquare (2kstar)	24.64	90% Percentile	0.0666
95% Percentile	0.0747	99% Percentile	0.0915

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.106	0.111	95% Approx. Gamma UPL	0.0774	0.079
95% Gamma USL	0.0747	0.0761			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0449	SD (KM)	0.0127
Variance (KM)	1.6150E-4	SE of Mean (KM)	0.00635
k hat (KM)	12.47	k star (KM)	7.222
nu hat (KM)	174.6	nu star (KM)	101.1
theta hat (KM)	0.0036	theta star (KM)	0.00621
80% gamma percentile (KM)	0.058	90% gamma percentile (KM)	0.0672
95% gamma percentile (KM)	0.0754	99% gamma percentile (KM)	0.0925

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.114	0.119	95% Approx. Gamma UPL	0.081	0.0828
95% KM Gamma Percentile	0.0718	0.0729	95% Gamma USL	0.0779	0.0795

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.768	Shapiro Wilk GOF Test	

5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.335	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0442	Mean in Log Scale	-3.159
SD in Original Scale	0.0117	SD in Log Scale	0.331
95% UTL95% Coverage	0.131	95% BCA UTL95% Coverage	0.057
95% Bootstrap (%) UTL95% Coverage	0.057	95% UPL (t)	0.0844
90% Percentile (z)	0.0649	95% Percentile (z)	0.0731
99% Percentile (z)	0.0916	95% USL	0.0806

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-3.159	95% KM UTL (Lognormal)95% Coverage	0.145
KM SD of Logged Data	0.362	95% KM UPL (Lognormal)	0.0901
95% KM Percentile Lognormal (z)	0.077	95% KM USL (Lognormal)	0.0857

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0749	Mean in Log Scale	-2.816
SD in Original Scale	0.06	SD in Log Scale	0.703
95% UTL95% Coverage	0.653	95% UPL (t)	0.258
90% Percentile (z)	0.147	95% Percentile (z)	0.19
99% Percentile (z)	0.307	95% USL	0.234

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	7	95% UTL with95% Coverage	0.4
Approx, f used to compute achieved CC	0.368	Approximate Actual Confidence Coefficient achieved by U	0.302
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.4
95% USL	0.4	95% KM Chebyshev UPL	0.104

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Fluorene|mg/kg

General Statistics

Total Number of Observations	6	Number of Missing Observations	5
Number of Distinct Observations	6		
Number of Detects	5	Number of Non-Detects	1
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	0.0041	Minimum Non-Detect	0.239
Maximum Detect	0.064	Maximum Non-Detect	0.239
Variance Detected	5.9729E-4	Percent Non-Detects	16.67%
Mean Detected	0.0422	SD Detected	0.0244
Mean of Detected Logged Data	-3.494	SD of Detected Logged Data	1.151

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.88	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.285	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0422	KM SD	0.0219
95% UTL95% Coverage	0.123	95% KM UPL (t)	0.0898
90% KM Percentile (z)	0.0702	95% KM Percentile (z)	0.0782
99% KM Percentile (z)	0.0931	95% KM USL	0.0821

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0551	SD	0.0384
95% UTL95% Coverage	0.197	95% UPL (t)	0.139
90% Percentile (z)	0.104	95% Percentile (z)	0.118
99% Percentile (z)	0.144	95% USL	0.125

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.668	Anderson-Darling GOF Test
5% A-D Critical Value	0.686	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.321	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.361	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.665	k star (bias corrected MLE)	0.799
Theta hat (MLE)	0.0254	Theta star (bias corrected MLE)	0.0528
nu hat (MLE)	16.65	nu star (bias corrected)	7.994
MLE Mean (bias corrected)	0.0422		
MLE Sd (bias corrected)	0.0472	95% Percentile of Chisquare (2kstar)	5.188

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0041	Mean	0.0416
Maximum	0.064	Median	0.0463
SD	0.0219	CV	0.526
k hat (MLE)	1.969	k star (bias corrected MLE)	1.095
Theta hat (MLE)	0.0211	Theta star (bias corrected MLE)	0.038
nu hat (MLE)	23.62	nu star (bias corrected)	13.15
MLE Mean (bias corrected)	0.0416	MLE Sd (bias corrected)	0.0398
95% Percentile of Chisquare (2kstar)	6.356	90% Percentile	0.0937
95% Percentile	0.121	99% Percentile	0.183

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.286	0.363	95% Approx. Gamma UPL	0.143	0.162
95% Gamma USL	0.119	0.131			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0422	SD (KM)	0.0219

Variance (KM)	4.7783E-4	SE of Mean (KM)	0.0109
k hat (KM)	3.73	k star (KM)	1.976
nu hat (KM)	44.77	nu star (KM)	23.72
theta hat (KM)	0.0113	theta star (KM)	0.0214
80% gamma percentile (KM)	0.0633	90% gamma percentile (KM)	0.0823
95% gamma percentile (KM)	0.101	99% gamma percentile (KM)	0.141

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.283	0.357	95% Approx. Gamma UPL	0.141	0.159
95% KM Gamma Percentile	0.106	0.115	95% Gamma USL	0.117	0.128

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.73	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.318	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0402	Mean in Log Scale	-3.494
SD in Original Scale	0.0224	SD in Log Scale	1.029
95% UTL95% Coverage	1.38	95% BCA UTL95% Coverage	0.064
95% Bootstrap (%) UTL95% Coverage	0.064	95% UPL (t)	0.285
90% Percentile (z)	0.114	95% Percentile (z)	0.165
99% Percentile (z)	0.333	95% USL	0.198

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-3.494	95% KM UTL (Lognormal)95% Coverage	1.38
KM SD of Logged Data	1.029	95% KM UPL (Lognormal)	0.285
95% KM Percentile Lognormal (z)	0.165	95% KM USL (Lognormal)	0.198

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0551	Mean in Log Scale	-3.266
SD in Original Scale	0.0384	SD in Log Scale	1.171
95% UTL95% Coverage	2.936	95% UPL (t)	0.488
90% Percentile (z)	0.171	95% Percentile (z)	0.262
99% Percentile (z)	0.582	95% USL	0.322

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	6	95% UTL with95% Coverage	0.239
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.239
95% USL	0.239	95% KM Chebyshev UPL	0.145

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Carbazole|mg/kg

General Statistics

Total Number of Observations	6	Number of Missing Observations	5
Number of Distinct Observations	6		
Number of Detects	5	Number of Non-Detects	1
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	0.24	Minimum Non-Detect	0.28
Maximum Detect	0.62	Maximum Non-Detect	0.28
Variance Detected	0.0278	Percent Non-Detects	16.67%
Mean Detected	0.474	SD Detected	0.167
Mean of Detected Logged Data	-0.806	SD of Detected Logged Data	0.41

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.869	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.275	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.435	KM SD	0.162
95% UTL95% Coverage	1.035	95% KM UPL (t)	0.787
90% KM Percentile (z)	0.643	95% KM Percentile (z)	0.701
99% KM Percentile (z)	0.812	95% KM USL	0.73

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.419	SD	0.202
95% UTL95% Coverage	1.168	95% UPL (t)	0.859
90% Percentile (z)	0.678	95% Percentile (z)	0.751
99% Percentile (z)	0.889	95% USL	0.787

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.476	Anderson-Darling GOF Test	
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.31	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	8.397	k star (bias corrected MLE)	3.492
Theta hat (MLE)	0.0565	Theta star (bias corrected MLE)	0.136
nu hat (MLE)	83.97	nu star (bias corrected)	34.92
MLE Mean (bias corrected)	0.474		
MLE Sd (bias corrected)	0.254	95% Percentile of Chisquare (2kstar)	14.04

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.24	Mean	0.438
Maximum	0.62	Median	0.455

SD	0.174	CV	0.397
k hat (MLE)	6.958	k star (bias corrected MLE)	3.59
Theta hat (MLE)	0.063	Theta star (bias corrected MLE)	0.122
nu hat (MLE)	83.49	nu star (bias corrected)	43.08
MLE Mean (bias corrected)	0.438	MLE Sd (bias corrected)	0.231
95% Percentile of Chisquare (2kstar)	14.33	90% Percentile	0.748
95% Percentile	0.874	99% Percentile	1.145

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	1.473	1.567	95% Approx. Gamma UPL	0.931	0.954
95% Gamma USL	0.829	0.842			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.435	SD (KM)	0.162
Variance (KM)	0.0262	SE of Mean (KM)	0.0738
k hat (KM)	7.242	k star (KM)	3.732
nu hat (KM)	86.9	nu star (KM)	44.79
theta hat (KM)	0.0601	theta star (KM)	0.117
80% gamma percentile (KM)	0.605	90% gamma percentile (KM)	0.737
95% gamma percentile (KM)	0.86	99% gamma percentile (KM)	1.122

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	1.374	1.453	95% Approx. Gamma UPL	0.886	0.904
95% KM Gamma Percentile	0.748	0.756	95% Gamma USL	0.792	0.803

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.847	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.295	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.437	Mean in Log Scale	-0.902
SD in Original Scale	0.175	SD in Log Scale	0.435
95% UTL95% Coverage	2.039	95% BCA UTL95% Coverage	0.62
95% Bootstrap (%) UTL95% Coverage	0.62	95% UPL (t)	1.046
90% Percentile (z)	0.709	95% Percentile (z)	0.83
99% Percentile (z)	1.117	95% USL	0.897

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-0.91	95% KM UTL (Lognormal)95% Coverage	1.82
KM SD of Logged Data	0.407	95% KM UPL (Lognormal)	0.976
95% KM Percentile Lognormal (z)	0.786	95% KM USL (Lognormal)	0.845

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.419	Mean in Log Scale	-1
SD in Original Scale	0.202	SD in Log Scale	0.599
95% UTL95% Coverage	3.39	95% UPL (t)	1.355
90% Percentile (z)	0.793	95% Percentile (z)	0.985
99% Percentile (z)	1.482	95% USL	1.096

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	6	95% UTL with95% Coverage	0.62
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.62
95% USL	0.62	95% KM Chebyshev UPL	1.197

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_SVOCs|Acenaphthene|mg/kg

General Statistics

Total Number of Observations	6	Number of Missing Observations	5
Number of Distinct Observations	6		
Number of Detects	4	Number of Non-Detects	2
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	0.018	Minimum Non-Detect	0.012
Maximum Detect	0.035	Maximum Non-Detect	0.239
Variance Detected	5.67E-05	Percent Non-Detects	33.33%
Mean Detected	0.029	SD Detected	0.00753
Mean of Detected Logged Data	-3.571	SD of Detected Logged Data	0.302

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.826	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.355	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0256	KM SD	0.00896
95% UTL95% Coverage	0.0588	95% KM UPL (t)	0.0451
90% KM Percentile (z)	0.0371	95% KM Percentile (z)	0.0403
99% KM Percentile (z)	0.0464	95% KM USL	0.0419

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0403	SD	0.0403
95% UTL95% Coverage	0.19	95% UPL (t)	0.128
90% Percentile (z)	0.0919	95% Percentile (z)	0.107
99% Percentile (z)	0.134	95% USL	0.114

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.593	Anderson-Darling GOF Test	
5% A-D Critical Value	0.657	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.389	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.394	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	16.33	k star (bias corrected MLE)	4.249
Theta hat (MLE)	0.00178	Theta star (bias corrected MLE)	0.00683
nu hat (MLE)	130.6	nu star (bias corrected)	33.99
MLE Mean (bias corrected)	0.029		
MLE Sd (bias corrected)	0.0141	95% Percentile of Chisquare (2kstar)	16.21

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0135	Mean	0.0259
Maximum	0.035	Median	0.0283
SD	0.00851	CV	0.329
k hat (MLE)	9.459	k star (bias corrected MLE)	4.841
Theta hat (MLE)	0.00273	Theta star (bias corrected MLE)	0.00534
nu hat (MLE)	113.5	nu star (bias corrected)	58.09
MLE Mean (bias corrected)	0.0259	MLE Sd (bias corrected)	0.0118
95% Percentile of Chisquare (2kstar)	17.87	90% Percentile	0.0416
95% Percentile	0.0477	99% Percentile	0.0607

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.0755	0.0796	95% Approx. Gamma UPL	0.0502	0.0513
95% Gamma USL	0.0452	0.046			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0256	SD (KM)	0.00896
Variance (KM)	8.02E-05	SE of Mean (KM)	0.00463
k hat (KM)	8.167	k star (KM)	4.195
nu hat (KM)	98.01	nu star (KM)	50.34
theta hat (KM)	0.00313	theta star (KM)	0.0061
80% gamma percentile (KM)	0.0351	90% gamma percentile (KM)	0.0424
95% gamma percentile (KM)	0.049	99% gamma percentile (KM)	0.0632

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.08	0.0851	95% Approx. Gamma UPL	0.0518	0.0531
95% KM Gamma Percentile	0.0438	0.0444	95% Gamma USL	0.0463	0.0472

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.782	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.377	Lilliefors GOF Test
5% Lilliefors Critical Value	0.375	Data Not Lognormal at 5% Significance Level

Detected Data appear Approximate Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0258	Mean in Log Scale	-3.708
SD in Original Scale	0.00836	SD in Log Scale	0.362
95% UTL95% Coverage	0.094	95% BCA UTL95% Coverage	0.035
95% Bootstrap (%) UTL95% Coverage	0.035	95% UPL (t)	0.054
90% Percentile (z)	0.039	95% Percentile (z)	0.0445
99% Percentile (z)	0.057	95% USL	0.0475

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-3.742	95% KM UTL (Lognormal)95% Coverage	0.11
KM SD of Logged Data	0.413	95% KM UPL (Lognormal)	0.0583
95% KM Percentile Lognormal (z)	0.0468	95% KM USL (Lognormal)	0.0503

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0403	Mean in Log Scale	-3.588
SD in Original Scale	0.0403	SD in Log Scale	0.975
95% UTL95% Coverage	1.027	95% UPL (t)	0.231
90% Percentile (z)	0.0965	95% Percentile (z)	0.137
99% Percentile (z)	0.267	95% USL	0.163

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	6	95% UTL with95% Coverage	0.239
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by U	0.265
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.239
95% USL	0.239	95% KM Chebyshev UPL	0.0678

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/24/2020 4:19:31 PM
From File	SD_Input.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

RA_SE_Metals|Selenium|mg/kg

General Statistics

Total Number of Observations	7	Number of Missing Observations	4
Number of Distinct Observations	7		
Number of Detects	6	Number of Non-Detects	1
Number of Distinct Detects	6	Number of Distinct Non-Detects	1
Minimum Detect	0.09	Minimum Non-Detect	2.7
Maximum Detect	0.6	Maximum Non-Detect	2.7
Variance Detected	0.032	Percent Non-Detects	14.29%
Mean Detected	0.258	SD Detected	0.179
Mean of Detected Logged Data	-1.528	SD of Detected Logged Data	0.626

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.399	d2max (for USL)	1.938

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.818	Shapiro Wilk GOF Test	

5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.283	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.258	KM SD	0.163
95% UTL95% Coverage	0.813	95% KM UPL (t)	0.597
90% KM Percentile (z)	0.467	95% KM Percentile (z)	0.526
99% KM Percentile (z)	0.638	95% KM USL	0.574

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.414	SD	0.444
95% UTL95% Coverage	1.923	95% UPL (t)	1.336
90% Percentile (z)	0.983	95% Percentile (z)	1.144
99% Percentile (z)	1.447	95% USL	1.274

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.333	Anderson-Darling GOF Test	
5% A-D Critical Value	0.701	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.201	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.334	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only

k hat (MLE)	3.084	k star (bias corrected MLE)	1.653
Theta hat (MLE)	0.0835	Theta star (bias corrected MLE)	0.156
nu hat (MLE)	37.01	nu star (bias corrected)	19.84
MLE Mean (bias corrected)	0.258		
MLE Sd (bias corrected)	0.2	95% Percentile of Chisquare (2kstar)	8.339

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.09	Mean	0.254
Maximum	0.6	Median	0.22
SD	0.164	CV	0.643
k hat (MLE)	3.563	k star (bias corrected MLE)	2.131
Theta hat (MLE)	0.0714	Theta star (bias corrected MLE)	0.119
nu hat (MLE)	49.88	nu star (bias corrected)	29.84
MLE Mean (bias corrected)	0.254	MLE Sd (bias corrected)	0.174
95% Percentile of Chisquare (2kstar)	9.911	90% Percentile	0.488
95% Percentile	0.592	99% Percentile	0.822

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	1.072	1.145	95% Approx. Gamma UPL	0.645	0.658
95% Gamma USL	0.608	0.618			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.258	SD (KM)	0.163
Variance (KM)	0.0267	SE of Mean (KM)	0.0731
k hat (KM)	2.484	k star (KM)	1.514

nu hat (KM)	34.77	nu star (KM)	21.2
theta hat (KM)	0.104	theta star (KM)	0.17
80% gamma percentile (KM)	0.398	90% gamma percentile (KM)	0.535
95% gamma percentile (KM)	0.669	99% gamma percentile (KM)	0.969

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	1.069	1.139	95% Approx. Gamma UPL	0.643	0.655
95% KM Gamma Percentile	0.533	0.537	95% Gamma USL	0.606	0.615

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.965	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.181	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.252	Mean in Log Scale	-1.528
SD in Original Scale	0.164	SD in Log Scale	0.571
95% UTL95% Coverage	1.514	95% BCA UTL95% Coverage	0.6
95% Bootstrap (%) UTL95% Coverage	0.6	95% UPL (t)	0.711
90% Percentile (z)	0.451	95% Percentile (z)	0.556
99% Percentile (z)	0.82	95% USL	0.657

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-1.528	95% KM UTL (Lognormal)95% Coverage	1.514
KM SD of Logged Data	0.571	95% KM UPL (Lognormal)	0.711
95% KM Percentile Lognormal (z)	0.556	95% KM USL (Lognormal)	0.657

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.414	Mean in Log Scale	-1.266
SD in Original Scale	0.444	SD in Log Scale	0.896
95% UTL95% Coverage	5.934	95% UPL (t)	1.815
90% Percentile (z)	0.889	95% Percentile (z)	1.231
99% Percentile (z)	2.268	95% USL	1.602

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	7	95% UTL with95% Coverage	2.7
Approx, f used to compute achieved CC	0.368	Approximate Actual Confidence Coefficient achieved by U	0.302
Approximate Sample Size needed to achieve specified C(	59	95% UPL	2.7
95% USL	2.7	95% KM Chebyshev UPL	1.019

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.19/22/2020 12:52:31 PM
From File	C:\Users\scesnyc\Desktop\DeskTop Folder\Blue Beach\Input\SD_Input.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

RA_SE_Metals|Aluminum|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	3460	First Quartile	4345
Second Largest	7600	Median	5135
Maximum	7710	Third Quartile	6978
Mean	5581	SD	1570
Coefficient of Variation	0.281	Skewness	0.23
Mean of logged Data	8.591	SD of logged Data	0.285

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.901	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.186	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	10151	90% Percentile (z)	7593
95% UPL (t)	8599	95% Percentile (z)	8163
95% USL	8997	99% Percentile (z)	9233

Gamma GOF Test

A-D Test Statistic	0.444	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.201	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	13.94	k star (bias corrected MLE)	9.823
Theta hat (MLE)	400.4	Theta star (bias corrected MLE)	568.1
nu hat (MLE)	278.8	nu star (bias corrected)	196.5
MLE Mean (bias corrected)	5581	MLE Sd (bias corrected)	1781

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	9010	90% Percentile	7950
95% Hawkins Wixley (HW) Approx. Gamma UPL	9078	95% Percentile	8796
95% WH Approx. Gamma UTL with 95% Coverage	11330	99% Percentile	10534
95% HW Approx. Gamma UTL with 95% Coverage	11546		
95% WH USL	9571	95% HW USL	9669

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.192	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	12355	90% Percentile (z)	7759
95% UPL (t)	9318	95% Percentile (z)	8607
95% USL	10017	99% Percentile (z)	10456

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	7710
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	7710	95% BCA Bootstrap UTL with 95% Coverage	7710
95% UPL	7710	90% Percentile	7611
90% Chebyshev UPL	10521	95% Percentile	7661
95% Chebyshev UPL	12759	99% Percentile	7700
95% USL	7710		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Arsenic|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	1.3	First Quartile	1.453
Second Largest	1.98	Median	1.495
Maximum	2.05	Third Quartile	1.67
Mean	1.587	SD	0.249
Coefficient of Variation	0.157	Skewness	1.124
Mean of logged Data	0.452	SD of logged Data	0.149

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.842	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.306	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	2.313	90% Percentile (z)	1.907
95% UPL (t)	2.067	95% Percentile (z)	1.997
95% USL	2.13	99% Percentile (z)	2.167

Gamma GOF Test

A-D Test Statistic	0.739	Anderson-Darling Gamma GOF Test	

5% A-D Critical Value	0.724	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.299	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.266	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	48.52	k star (bias corrected MLE)	34.03
Theta hat (MLE)	0.0327	Theta star (bias corrected MLE)	0.0466
nu hat (MLE)	970.4	nu star (bias corrected)	680.6
MLE Mean (bias corrected)	1.587	MLE Sd (bias corrected)	0.272

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	2.082	90% Percentile	1.944
95% Hawkins Wixley (HW) Approx. Gamma UPL	2.084	95% Percentile	2.059
95% WH Approx. Gamma UTL with 95% Coverage	2.379	99% Percentile	2.287
95% HW Approx. Gamma UTL with 95% Coverage	2.389		
95% WH USL	2.156	95% HW USL	2.159

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.872	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.287	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	2.423	90% Percentile (z)	1.901
95% UPL (t)	2.091	95% Percentile (z)	2.007
95% USL	2.172	99% Percentile (z)	2.221

Nonparametric Distribution Free Background Statistics
Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	2.05
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	2.05	95% BCA Bootstrap UTL with 95% Coverage	2.05
95% UPL	2.05	90% Percentile	1.987
90% Chebyshev UPL	2.372	95% Percentile	2.019
95% Chebyshev UPL	2.728	99% Percentile	2.044
95% USL	2.05		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Iron|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	7740	First Quartile	11475
Second Largest	15000	Median	12450
Maximum	15800	Third Quartile	13925
Mean	12278	SD	2596
Coefficient of Variation	0.211	Skewness	-0.592

Mean of logged Data	9.393	SD of logged Data	0.231

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.946	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.168	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	19835	90% Percentile (z)	15605
95% UPL (t)	17269	95% Percentile (z)	16548
95% USL	17927	99% Percentile (z)	18317

Gamma GOF Test

A-D Test Statistic	0.396	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.192	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	22.27	k star (bias corrected MLE)	15.66
Theta hat (MLE)	551.3	Theta star (bias corrected MLE)	784.2
nu hat (MLE)	445.4	nu star (bias corrected)	313.1
MLE Mean (bias corrected)	12278	MLE Sd (bias corrected)	3103

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	18107	90% Percentile	16384
95% Hawkins Wixley (HW) Approx. Gamma UPL	18245	95% Percentile	17787
95% WH Approx. Gamma UTL with 95% Coverage	21851	99% Percentile	20623
95% HW Approx. Gamma UTL with 95% Coverage	22212		
95% WH USL	19022	95% HW USL	19207

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.904	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.212	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	23536	90% Percentile (z)	16145
95% UPL (t)	18726	95% Percentile (z)	17561
95% USL	19857	99% Percentile (z)	20559

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	15800
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	15800	95% BCA Bootstrap UTL with 95% Coverage	15800
95% UPL	15800	90% Percentile	15080

90% Chebyshev UPL	20446	95% Percentile	15440
95% Chebyshev UPL	24146	99% Percentile	15728
95% USL	15800		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_SE_Metals|Manganese|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	101	First Quartile	128.8
Second Largest	180	Median	148
Maximum	221	Third Quartile	175.5
Mean	152.5	SD	35.22
Coefficient of Variation	0.231	Skewness	0.516
Mean of logged Data	5.003	SD of logged Data	0.23

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.974	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.14	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	255	90% Percentile (z)	197.6
95% UPL (t)	220.2	95% Percentile (z)	210.4
95% USL	229.1	99% Percentile (z)	234.4

Gamma GOF Test

A-D Test Statistic	0.147	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.113	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	21.14	k star (bias corrected MLE)	14.87
Theta hat (MLE)	7.212	Theta star (bias corrected MLE)	10.26
nu hat (MLE)	422.9	nu star (bias corrected)	297.4
MLE Mean (bias corrected)	152.5	MLE Sd (bias corrected)	39.55

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	226.9	90% Percentile	204.9
95% Hawkins Wixley (HW) Approx. Gamma UPL	228.1	95% Percentile	222.8
95% WH Approx. Gamma UTL with 95% Coverage	275	99% Percentile	259.2
95% HW Approx. Gamma UTL with 95% Coverage	278.5		
95% WH USL	238.7	95% HW USL	240.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.99	Shapiro Wilk Lognormal GOF Test	

5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.105	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	291.3	90% Percentile (z)	200.1
95% UPL (t)	231.9	95% Percentile (z)	217.6
95% USL	245.9	99% Percentile (z)	254.6

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	221
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	221	95% BCA Bootstrap UTL with 95% Coverage	221
95% UPL	221	90% Percentile	184.1
90% Chebyshev UPL	263.3	95% Percentile	202.6
95% Chebyshev UPL	313.5	99% Percentile	217.3
95% USL	221		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.19/24/2020 4:32:07 PM
From File	C:\Users\scesnyc\Desktop\DeskTop Folder\Blue Beach\Input\SD_Input.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

RA_SE_Metals|Cobalt|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	2.45	First Quartile	3.37
Second Largest	4.97	Median	4.265
Maximum	7.69	Third Quartile	4.415
Mean	4.221	SD	1.452
Coefficient of Variation	0.344	Skewness	1.487
Mean of logged Data	1.393	SD of logged Data	0.318

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.864	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.24	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	8.448	90% Percentile (z)	6.082
95% UPL (t)	7.012	95% Percentile (z)	6.609
95% USL	7.38	99% Percentile (z)	7.599

Gamma GOF Test

A-D Test Statistic	0.386	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.194	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	10.72	k star (bias corrected MLE)	7.571
Theta hat (MLE)	0.394	Theta star (bias corrected MLE)	0.558
nu hat (MLE)	214.4	nu star (bias corrected)	151.4
MLE Mean (bias corrected)	4.221	MLE Sd (bias corrected)	1.534

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	7.215	90% Percentile	6.267
95% Hawkins Wixley (HW) Approx. Gamma UPL	7.259	95% Percentile	7.02
95% WH Approx. Gamma UTL with 95% Coverage	9.31	99% Percentile	8.58
95% HW Approx. Gamma UTL with 95% Coverage	9.485		
95% WH USL	7.719	95% HW USL	7.788

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.947	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.179	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	10.17	90% Percentile (z)	6.055
95% UPL (t)	7.426	95% Percentile (z)	6.797
95% USL	8.05	99% Percentile (z)	8.445

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	7.69
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	7.69	95% BCA Bootstrap UTL with 95% Coverage	7.69
95% UPL	7.69	90% Percentile	5.242
90% Chebyshev UPL	8.789	95% Percentile	6.466
95% Chebyshev UPL	10.86	99% Percentile	7.445
95% USL	7.69		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/22/2020 12:53:57 PM
From File	SD_Input_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

RA_SE_Metals|Thallium|mg/kg

General Statistics

Total Number of Observations	10	Number of Missing Observations	0
Number of Distinct Observations	10		
Number of Detects	4	Number of Non-Detects	6
Number of Distinct Detects	4	Number of Distinct Non-Detects	6
Minimum Detect	0.106	Minimum Non-Detect	0.034
Maximum Detect	0.15	Maximum Non-Detect	0.046
Variance Detected	4.3292E-4	Percent Non-Detects	60%
Mean Detected	0.133	SD Detected	0.0208
Mean of Detected Logged Data	-2.025	SD of Detected Logged Data	0.163

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.877	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.275	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0737	KM SD	0.0499
95% UTL95% Coverage	0.219	95% KM UPL (t)	0.17
90% KM Percentile (z)	0.138	95% KM Percentile (z)	0.156
99% KM Percentile (z)	0.19	95% KM USL	0.182

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0649	SD	0.0601
95% UTL95% Coverage	0.24	95% UPL (t)	0.18
90% Percentile (z)	0.142	95% Percentile (z)	0.164
99% Percentile (z)	0.205	95% USL	0.196

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.41	Anderson-Darling GOF Test	
5% A-D Critical Value	0.656	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.306	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.394	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	51.64	k star (bias corrected MLE)	13.08
Theta hat (MLE)	0.00258	Theta star (bias corrected MLE)	0.0102

nu hat (MLE)	413.1	nu star (bias corrected)	104.6
MLE Mean (bias corrected)	0.133		
MLE Sd (bias corrected)	0.0368	95% Percentile of Chisquare (2kstar)	39.07

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0717	Mean	0.0963
Maximum	0.15	Median	0.0717
SD	0.034	CV	0.353
k hat (MLE)	9.928	k star (bias corrected MLE)	7.017
Theta hat (MLE)	0.0097	Theta star (bias corrected MLE)	0.0137
nu hat (MLE)	198.6	nu star (bias corrected)	140.3
MLE Mean (bias corrected)	0.0963	MLE Sd (bias corrected)	0.0364
95% Percentile of Chisquare (2kstar)	23.73	90% Percentile	0.145
95% Percentile	0.163	99% Percentile	0.2

The following statistics are computed using Gamma ROS Statistics on Imputed Data
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.218	0.223	95% Approx. Gamma UPL	0.168	0.169
95% Gamma USL	0.18	0.181			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0737	SD (KM)	0.0499
Variance (KM)	0.00249	SE of Mean (KM)	0.0182
k hat (KM)	2.178	k star (KM)	1.591
nu hat (KM)	43.56	nu star (KM)	31.82
theta hat (KM)	0.0338	theta star (KM)	0.0463
80% gamma percentile (KM)	0.113	90% gamma percentile (KM)	0.151
95% gamma percentile (KM)	0.188	99% gamma percentile (KM)	0.271

The following statistics are computed using gamma distribution and KM estimates
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.296	0.316	95% Approx. Gamma UPL	0.191	0.195
95% KM Gamma Percentile	0.166	0.168	95% Gamma USL	0.215	0.222

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.871	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.271	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.101	Mean in Log Scale	-2.333
SD in Original Scale	0.0305	SD in Log Scale	0.281
95% UTL95% Coverage	0.22	95% BCA UTL95% Coverage	0.15
95% Bootstrap (%) UTL95% Coverage	0.15	95% UPL (t)	0.167
90% Percentile (z)	0.139	95% Percentile (z)	0.154
99% Percentile (z)	0.187	95% USL	0.179

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-2.839	95% KM UTL (Lognormal)95% Coverage	0.412

KM SD of Logged Data	0.67	95% KM UPL (Lognormal)	0.212
95% KM Percentile Lognormal (z)	0.176	95% KM USL (Lognormal)	0.252

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0649	Mean in Log Scale	-3.183
SD in Original Scale	0.0601	SD in Log Scale	1.004
95% UTL95% Coverage	0.771	95% UPL (t)	0.286
90% Percentile (z)	0.15	95% Percentile (z)	0.216
99% Percentile (z)	0.428	95% USL	0.368

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	10	95% UTL with95% Coverage	0.15
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.15
95% USL	0.15	95% KM Chebyshev UPL	0.302

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.19/22/2020 1:11:40 PM
From File	C:\Users\scesnyc\Desktop\DeskTop Folder\Blue Beach\Input\HS_Input.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

RA_HS_Metals|Aluminum|mg/kg

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	1
Minimum	3880	First Quartile	5510
Second Largest	8310	Median	6100
Maximum	8510	Third Quartile	7540
Mean	6422	SD	1508
Coefficient of Variation	0.235	Skewness	-0.0735
Mean of logged Data	8.741	SD of logged Data	0.248

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.962	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.14	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	10992	90% Percentile (z)	8355
95% UPL (t)	9378	95% Percentile (z)	8902
95% USL	9603	99% Percentile (z)	9930

Gamma GOF Test

A-D Test Statistic	0.22	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.721	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.121	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.279	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	19.24	k star (bias corrected MLE)	12.9
Theta hat (MLE)	333.7	Theta star (bias corrected MLE)	497.7
nu hat (MLE)	346.4	nu star (bias corrected)	232.3
MLE Mean (bias corrected)	6422	MLE Sd (bias corrected)	1788

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	9825	90% Percentile	8793
95% Hawkins Wixley (HW) Approx. Gamma UPL	9902	95% Percentile	9618
95% WH Approx. Gamma UTL with 95% Coverage	12203	99% Percentile	11295

95% HW Approx. Gamma UTL with 95% Coverage	12426		
95% WH USL	10137	95% HW USL	10228

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.949	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.136	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	13261	90% Percentile (z)	8595
95% UPL (t)	10170	95% Percentile (z)	9405
95% USL	10553	99% Percentile (z)	11136

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with 95% Coverage	8510
Approx, f used to compute achieved CC	0.474	Approximate Actual Confidence Coefficient achieved by U	0.37
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	8510	95% BCA Bootstrap UTL with 95% Coverage	8510
95% UPL	8510	90% Percentile	8350
90% Chebyshev UPL	11190	95% Percentile	8430
95% Chebyshev UPL	13350	99% Percentile	8494
95% USL	8510		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_Metals|Lead|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	23	First Quartile	31.25
Second Largest	45.4	Median	35.35
Maximum	50.3	Third Quartile	38.53
Mean	35.42	SD	8.399
Coefficient of Variation	0.237	Skewness	0.281
Mean of logged Data	3.541	SD of logged Data	0.242

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.972	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.152	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	59.87	90% Percentile (z)	46.18
95% UPL (t)	51.57	95% Percentile (z)	49.24
95% USL	53.7	99% Percentile (z)	54.96
Gamma GOF Test			
A-D Test Statistic	0.185	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.123	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	19.47	k star (bias corrected MLE)	13.7
Theta hat (MLE)	1.819	Theta star (bias corrected MLE)	2.586
nu hat (MLE)	389.5	nu star (bias corrected)	274
MLE Mean (bias corrected)	35.42	MLE Sd (bias corrected)	9.57
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	53.51	90% Percentile	48.1
95% Hawkins Wixley (HW) Approx. Gamma UPL	53.83	95% Percentile	52.49
95% WH Approx. Gamma UTL with 95% Coverage	65.29	99% Percentile	61.39
95% HW Approx. Gamma UTL with 95% Coverage	66.27		
95% WH USL	56.38	95% HW USL	56.84
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.972	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.133	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	69.83	90% Percentile (z)	47.07
95% UPL (t)	54.97	95% Percentile (z)	51.4
95% USL	58.45	99% Percentile (z)	60.62
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	10	95% UTL with 95% Coverage	50.3
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	50.3	95% BCA Bootstrap UTL with 95% Coverage	50.3
95% UPL	50.3	90% Percentile	45.89
90% Chebyshev UPL	61.85	95% Percentile	48.1
95% Chebyshev UPL	73.82	99% Percentile	49.86
95% USL	50.3		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_Metals|Selenium|mg/kg

General Statistics			
Total Number of Observations	10	Number of Distinct Observations	8
Minimum	0.13	First Quartile	0.183
Second Largest	0.33	Median	0.23
Maximum	0.33	Third Quartile	0.29
Mean	0.235	SD	0.0714
Coefficient of Variation	0.304	Skewness	-0.0183
Mean of logged Data	-1.493	SD of logged Data	0.324

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test			
Shapiro Wilk Test Statistic	0.939	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.119	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	0.443	90% Percentile (z)	0.326
95% UPL (t)	0.372	95% Percentile (z)	0.352
95% USL	0.39	99% Percentile (z)	0.401

Gamma GOF Test			
A-D Test Statistic	0.284	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.153	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	11.24	k star (bias corrected MLE)	7.936
Theta hat (MLE)	0.0209	Theta star (bias corrected MLE)	0.0296
nu hat (MLE)	224.8	nu star (bias corrected)	158.7
MLE Mean (bias corrected)	0.235	MLE Sd (bias corrected)	0.0834

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	0.398	90% Percentile	0.346
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.402	95% Percentile	0.387
95% WH Approx. Gamma UTL with 95% Coverage	0.511	99% Percentile	0.471
95% HW Approx. Gamma UTL with 95% Coverage	0.524		
95% WH USL	0.425	95% HW USL	0.431

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.933	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.174	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.577	90% Percentile (z)	0.34
95% UPL (t)	0.419	95% Percentile (z)	0.383
95% USL	0.455	99% Percentile (z)	0.478

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	0.33
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.33	95% BCA Bootstrap UTL with 95% Coverage	0.33
95% UPL	0.33	90% Percentile	0.33
90% Chebyshev UPL	0.46	95% Percentile	0.33
95% Chebyshev UPL	0.561	99% Percentile	0.33
95% USL	0.33		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_Metals|Vanadium|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	8.14	First Quartile	12.73
Second Largest	17.8	Median	14.35
Maximum	20.1	Third Quartile	16.63
Mean	14.56	SD	3.418
Coefficient of Variation	0.235	Skewness	-0.254
Mean of logged Data	2.651	SD of logged Data	0.256

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.973	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.155	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	24.51	90% Percentile (z)	18.94
95% UPL (t)	21.13	95% Percentile (z)	20.19
95% USL	22	99% Percentile (z)	22.51

Gamma GOF Test

A-D Test Statistic	0.288	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.145	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics			
k hat (MLE)	18.31	k star (bias corrected MLE)	12.88
Theta hat (MLE)	0.795	Theta star (bias corrected MLE)	1.13
nu hat (MLE)	366.2	nu star (bias corrected)	257.7
MLE Mean (bias corrected)	14.56	MLE Sd (bias corrected)	4.058

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	22.26	90% Percentile	19.95
95% Hawkins Wixley (HW) Approx. Gamma UPL	22.45	95% Percentile	21.82
95% WH Approx. Gamma UTL with 95% Coverage	27.3	99% Percentile	25.62
95% HW Approx. Gamma UTL with 95% Coverage	27.83		
95% WH USL	23.49	95% HW USL	23.75

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.932	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.168	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	29.81	90% Percentile (z)	19.66
95% UPL (t)	23.16	95% Percentile (z)	21.57
95% USL	24.71	99% Percentile (z)	25.68

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	10	95% UTL with 95% Coverage	20.1
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	20.1	95% BCA Bootstrap UTL with 95% Coverage	20.1
95% UPL	20.1	90% Percentile	18.03
90% Chebyshev UPL	25.32	95% Percentile	19.07
95% Chebyshev UPL	30.19	99% Percentile	19.89
95% USL	20.1		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_Metals|Zinc|mg/kg

General Statistics			
Total Number of Observations	10	Number of Distinct Observations	10
Minimum	17.9	First Quartile	25.03
Second Largest	31.2	Median	27
Maximum	37.6	Third Quartile	30.58
Mean	27.29	SD	5.476
Coefficient of Variation	0.201	Skewness	0.167
Mean of logged Data	3.288	SD of logged Data	0.207

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176
Normal GOF Test			
Shapiro Wilk Test Statistic	0.982	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.138	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	43.23	90% Percentile (z)	34.31
95% UPL (t)	37.82	95% Percentile (z)	36.3
95% USL	39.21	99% Percentile (z)	40.03
Gamma GOF Test			
A-D Test Statistic	0.193	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.151	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	26.84	k star (bias corrected MLE)	18.85
Theta hat (MLE)	1.017	Theta star (bias corrected MLE)	1.447
nu hat (MLE)	536.8	nu star (bias corrected)	377.1
MLE Mean (bias corrected)	27.29	MLE Sd (bias corrected)	6.285
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	38.99	90% Percentile	35.59
95% Hawkins Wixley (HW) Approx. Gamma UPL	39.18	95% Percentile	38.38
95% WH Approx. Gamma UTL with 95% Coverage	46.37	99% Percentile	44
95% HW Approx. Gamma UTL with 95% Coverage	46.92		
95% WH USL	40.8	95% HW USL	41.07
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.974	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.169	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	48.88	90% Percentile (z)	34.91
95% UPL (t)	39.85	95% Percentile (z)	37.63
95% USL	41.99	99% Percentile (z)	43.32
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	10	95% UTL with 95% Coverage	37.6
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59

95% Percentile Bootstrap UTL with 95% Coverage	37.6	95% BCA Bootstrap UTL with 95% Coverage	37.6
95% UPL	37.6	90% Percentile	31.84
90% Chebyshev UPL	44.52	95% Percentile	34.72
95% Chebyshev UPL	52.33	99% Percentile	37.02
95% USL	37.6		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_SVOCs|Anthracene|mg/kg

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	1
Minimum	0.0022	First Quartile	0.0036
Second Largest	0.025	Median	0.0064
Maximum	0.028	Third Quartile	0.023
Mean	0.0122	SD	0.0106
Coefficient of Variation	0.874	Skewness	0.539
Mean of logged Data	-4.84	SD of logged Data	1.038

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.827	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.262	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.0445	90% Percentile (z)	0.0258
95% UPL (t)	0.0331	95% Percentile (z)	0.0297
95% USL	0.0347	99% Percentile (z)	0.037

Gamma GOF Test

A-D Test Statistic	0.586	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.214	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.285	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.296	k star (bias corrected MLE)	0.938
Theta hat (MLE)	0.00941	Theta star (bias corrected MLE)	0.013
nu hat (MLE)	23.32	nu star (bias corrected)	16.88
MLE Mean (bias corrected)	0.0122	MLE Sd (bias corrected)	0.0126

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0429	90% Percentile	0.0285
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0457	95% Percentile	0.0374

95% WH Approx. Gamma UTL with 95% Coverage	0.0777	99% Percentile	0.058
95% HW Approx. Gamma UTL with 95% Coverage	0.0896		
95% WH USL	0.047	95% HW USL	0.0506

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.875	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.181	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.184	90% Percentile (z)	0.0299
95% UPL (t)	0.0605	95% Percentile (z)	0.0436
95% USL	0.0707	99% Percentile (z)	0.0885

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with 95% Coverage	0.028
Approx, f used to compute achieved CC	0.474	Approximate Actual Confidence Coefficient achieved by U	0.37
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.028	95% BCA Bootstrap UTL with 95% Coverage	0.028
95% UPL	0.028	90% Percentile	0.0256
90% Chebyshev UPL	0.0459	95% Percentile	0.0268
95% Chebyshev UPL	0.0611	99% Percentile	0.0278
95% USL	0.028		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_SVOCs|Benzo(a)anthracene|mg/kg

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
		Number of Missing Observations	1
Minimum	0.016	First Quartile	0.026
Second Largest	0.17	Median	0.038
Maximum	0.23	Third Quartile	0.17
Mean	0.0897	SD	0.0821
Coefficient of Variation	0.916	Skewness	0.702
Mean of logged Data	-2.87	SD of logged Data	1.057

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.828	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.291	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.339	90% Percentile (z)	0.195
95% UPL (t)	0.251	95% Percentile (z)	0.225
95% USL	0.263	99% Percentile (z)	0.281

Gamma GOF Test

A-D Test Statistic	0.633	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.739	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.252	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.286	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.23	k star (bias corrected MLE)	0.894
Theta hat (MLE)	0.0729	Theta star (bias corrected MLE)	0.1
nu hat (MLE)	22.14	nu star (bias corrected)	16.09
MLE Mean (bias corrected)	0.0897	MLE Sd (bias corrected)	0.0948

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.322	90% Percentile	0.212
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.343	95% Percentile	0.28
95% WH Approx. Gamma UTL with 95% Coverage	0.59	99% Percentile	0.437
95% HW Approx. Gamma UTL with 95% Coverage	0.68		
95% WH USL	0.353	95% HW USL	0.38

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.873	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.203	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.398	90% Percentile (z)	0.22
95% UPL (t)	0.45	95% Percentile (z)	0.323
95% USL	0.528	99% Percentile (z)	0.663

Nonparametric Distribution Free Background Statistics

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with 95% Coverage	0.23
Approx, f used to compute achieved CC	0.474	Approximate Actual Confidence Coefficient achieved by U	0.37
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.23	95% BCA Bootstrap UTL with 95% Coverage	0.23
95% UPL	0.23	90% Percentile	0.182
90% Chebyshev UPL	0.349	95% Percentile	0.206
95% Chebyshev UPL	0.467	99% Percentile	0.225
95% USL	0.23		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_SVOCs|Benzo(a)Pyrene|mg/kg

General Statistics			
Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	1
Minimum	0.019	First Quartile	0.033
Second Largest	0.22	Median	0.047
Maximum	0.26	Third Quartile	0.2
Mean	0.107	SD	0.0968
Coefficient of Variation	0.903	Skewness	0.619
Mean of logged Data	-2.688	SD of logged Data	1.055
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11
Normal GOF Test			
Shapiro Wilk Test Statistic	0.825	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.288	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	0.4	90% Percentile (z)	0.231
95% UPL (t)	0.297	95% Percentile (z)	0.266
95% USL	0.311	99% Percentile (z)	0.332
Gamma GOF Test			
A-D Test Statistic	0.629	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.739	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.244	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.285	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.242	k star (bias corrected MLE)	0.902
Theta hat (MLE)	0.0862	Theta star (bias corrected MLE)	0.119
nu hat (MLE)	22.36	nu star (bias corrected)	16.24
MLE Mean (bias corrected)	0.107	MLE Sd (bias corrected)	0.113
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	0.384	90% Percentile	0.253
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.408	95% Percentile	0.333
95% WH Approx. Gamma UTL with 95% Coverage	0.7	99% Percentile	0.52
95% HW Approx. Gamma UTL with 95% Coverage	0.808		
95% WH USL	0.421	95% HW USL	0.452
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.871	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.193	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.666	90% Percentile (z)	0.263
95% UPL (t)	0.538	95% Percentile (z)	0.386
95% USL	0.63	99% Percentile (z)	0.792

Nonparametric Distribution Free Background Statistics
Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with 95% Coverage	0.26
Approx, f used to compute achieved CC	0.474	Approximate Actual Confidence Coefficient achieved by U	0.37
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.26	95% BCA Bootstrap UTL with 95% Coverage	0.26
95% UPL	0.26	90% Percentile	0.228
90% Chebyshev UPL	0.413	95% Percentile	0.244
95% Chebyshev UPL	0.552	99% Percentile	0.257
95% USL	0.26		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_SVOCs|Benzo(g,h,i)Perylene|mg/kg

General Statistics

Total Number of Observations	9	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	0.019	First Quartile	0.026
Second Largest	0.17	Median	0.036
Maximum	0.22	Third Quartile	0.14
Mean	0.0892	SD	0.078
Coefficient of Variation	0.874	Skewness	0.594
Mean of logged Data	-2.837	SD of logged Data	1.01

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.822	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.308	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.326	90% Percentile (z)	0.189
95% UPL (t)	0.242	95% Percentile (z)	0.217
95% USL	0.254	99% Percentile (z)	0.271

Gamma GOF Test

A-D Test Statistic	0.761	Anderson-Darling Gamma GOF Test	

5% A-D Critical Value	0.737	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.282	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.285	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.332	k star (bias corrected MLE)	0.962
Theta hat (MLE)	0.067	Theta star (bias corrected MLE)	0.0927
nu hat (MLE)	23.98	nu star (bias corrected)	17.32
MLE Mean (bias corrected)	0.0892	MLE Sd (bias corrected)	0.091

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.311	90% Percentile	0.207
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.329	95% Percentile	0.271
95% WH Approx. Gamma UTL with 95% Coverage	0.56	99% Percentile	0.419
95% HW Approx. Gamma UTL with 95% Coverage	0.641		
95% WH USL	0.34	95% HW USL	0.364

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.842	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.25	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.253	90% Percentile (z)	0.214
95% UPL (t)	0.425	95% Percentile (z)	0.309
95% USL	0.494	99% Percentile (z)	0.615

Nonparametric Distribution Free Background Statistics

Data appear Approximate Gamma Distribution at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with 95% Coverage	0.22
Approx, f used to compute achieved CC	0.474	Approximate Actual Confidence Coefficient achieved by U	0.37
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.22	95% BCA Bootstrap UTL with 95% Coverage	0.22
95% UPL	0.22	90% Percentile	0.18
90% Chebyshev UPL	0.336	95% Percentile	0.2
95% Chebyshev UPL	0.447	99% Percentile	0.216
95% USL	0.22		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_SVOCs|Benzo(k)Fluoranthene|mg/kg

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	1
Minimum	0.013	First Quartile	0.02

Second Largest	0.14	Median	0.027
Maximum	0.26	Third Quartile	0.11
Mean	0.0779	SD	0.0831
Coefficient of Variation	1.067	Skewness	1.488
Mean of logged Data	-3.076	SD of logged Data	1.098

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.798	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.285	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.33	90% Percentile (z)	0.184
95% UPL (t)	0.241	95% Percentile (z)	0.215
95% USL	0.253	99% Percentile (z)	0.271

Gamma GOF Test

A-D Test Statistic	0.574	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.281	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.286	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.092	k star (bias corrected MLE)	0.802
Theta hat (MLE)	0.0713	Theta star (bias corrected MLE)	0.0971
nu hat (MLE)	19.66	nu star (bias corrected)	14.44
MLE Mean (bias corrected)	0.0779	MLE Sd (bias corrected)	0.087

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.292	90% Percentile	0.189
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.308	95% Percentile	0.252
95% WH Approx. Gamma UTL with 95% Coverage	0.546	99% Percentile	0.402
95% HW Approx. Gamma UTL with 95% Coverage	0.627		
95% WH USL	0.321	95% HW USL	0.343

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.893	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.243	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.288	90% Percentile (z)	0.189
95% UPL (t)	0.397	95% Percentile (z)	0.281
95% USL	0.468	99% Percentile (z)	0.594

Nonparametric Distribution Free Background Statistics

Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with 95% Coverage	0.26
Approx, f used to compute achieved CC	0.474	Approximate Actual Confidence Coefficient achieved by U	0.37
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.26	95% BCA Bootstrap UTL with 95% Coverage	0.26
95% UPL	0.26	90% Percentile	0.164
90% Chebyshev UPL	0.341	95% Percentile	0.212
95% Chebyshev UPL	0.46	99% Percentile	0.25
95% USL	0.26		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_SVOCs|Indeno(1,2,3-CD)Pyrene|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	0.0145	First Quartile	0.019
Second Largest	0.16	Median	0.03
Maximum	0.24	Third Quartile	0.128
Mean	0.0782	SD	0.0793
Coefficient of Variation	1.015	Skewness	1.083
Mean of logged Data	-3.063	SD of logged Data	1.086

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.803	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.32	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.309	90% Percentile (z)	0.18
95% UPL (t)	0.231	95% Percentile (z)	0.209
95% USL	0.251	99% Percentile (z)	0.263

Gamma GOF Test

A-D Test Statistic	0.76	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.746	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.285	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.273	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.109	k star (bias corrected MLE)	0.843
Theta hat (MLE)	0.0705	Theta star (bias corrected MLE)	0.0927
nu hat (MLE)	22.18	nu star (bias corrected)	16.86
MLE Mean (bias corrected)	0.0782	MLE Sd (bias corrected)	0.0851

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.283	90% Percentile	0.188
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.298	95% Percentile	0.249
95% WH Approx. Gamma UTL with 95% Coverage	0.506	99% Percentile	0.393
95% HW Approx. Gamma UTL with 95% Coverage	0.576		
95% WH USL	0.332	95% HW USL	0.356

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.861	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.236	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.102	90% Percentile (z)	0.188
95% UPL (t)	0.377	95% Percentile (z)	0.279
95% USL	0.496	99% Percentile (z)	0.584

Nonparametric Distribution Free Background Statistics

Data appear Lognormal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	0.24
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.24	95% BCA Bootstrap UTL with 95% Coverage	0.24
95% UPL	0.24	90% Percentile	0.168
90% Chebyshev UPL	0.328	95% Percentile	0.204
95% Chebyshev UPL	0.441	99% Percentile	0.233
95% USL	0.24		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

From File

Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

RA_HS_Metals|Mercury|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
Minimum	0.026	First Quartile	0.034
Second Largest	0.056	Median	0.0455
Maximum	0.083	Third Quartile	0.0546
Mean	0.0465	SD	0.0165
Coefficient of Variation	0.354	Skewness	1.114

Mean of logged Data	-3.122	SD of logged Data	0.339

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.918	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.181	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.0944	90% Percentile (z)	0.0675
95% UPL (t)	0.0781	95% Percentile (z)	0.0735
95% USL	0.0823	99% Percentile (z)	0.0847

Gamma GOF Test

A-D Test Statistic	0.22	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.14	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	9.658	k star (bias corrected MLE)	6.827
Theta hat (MLE)	0.00481	Theta star (bias corrected MLE)	0.0068
nu hat (MLE)	193.2	nu star (bias corrected)	136.5
MLE Mean (bias corrected)	0.0465	MLE Sd (bias corrected)	0.0178

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0814	90% Percentile	0.0702
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0821	95% Percentile	0.079
95% WH Approx. Gamma UTL with 95% Coverage	0.106	99% Percentile	0.0974
95% HW Approx. Gamma UTL with 95% Coverage	0.109		
95% WH USL	0.0874	95% HW USL	0.0884

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.976	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.14	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.118	90% Percentile (z)	0.068
95% UPL (t)	0.0845	95% Percentile (z)	0.0769
95% USL	0.0921	99% Percentile (z)	0.0969

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	0.083
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401

		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.083	95% BCA Bootstrap UTL with 95% Coverage	0.083
95% UPL	0.083	90% Percentile	0.0587
90% Chebyshev UPL	0.0982	95% Percentile	0.0709
95% Chebyshev UPL	0.122	99% Percentile	0.0806
95% USL	0.083		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_SVOCs|Benzo(b)fluoranthene|mg/kg

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	1
Minimum	0.033	First Quartile	0.054
Second Largest	0.4	Median	0.069
Maximum	0.95	Third Quartile	0.36
Mean	0.248	SD	0.301
Coefficient of Variation	1.21	Skewness	1.841
Mean of logged Data	-2.034	SD of logged Data	1.21

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.749	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.28	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.16	90% Percentile (z)	0.634
95% UPL (t)	0.838	95% Percentile (z)	0.743
95% USL	0.883	99% Percentile (z)	0.948

Gamma GOF Test

A-D Test Statistic	0.644	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.746	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.292	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.288	Data Not Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.91	k star (bias corrected MLE)	0.681
Theta hat (MLE)	0.273	Theta star (bias corrected MLE)	0.365
nu hat (MLE)	16.39	nu star (bias corrected)	12.26
MLE Mean (bias corrected)	0.248	MLE Sd (bias corrected)	0.301

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.998	90% Percentile	0.628

95% Hawkins Wixley (HW) Approx. Gamma UPL	1.056	95% Percentile	0.854
95% WH Approx. Gamma UTL with 95% Coverage	1.936	99% Percentile	1.396
95% HW Approx. Gamma UTL with 95% Coverage	2.251		
95% WH USL	1.105	95% HW USL	1.184

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.881	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.257	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	5.12	90% Percentile (z)	0.617
95% UPL (t)	1.402	95% Percentile (z)	0.957
95% USL	1.679	99% Percentile (z)	2.183

Nonparametric Distribution Free Background Statistics

Data appear Approximate Gamma Distribution at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with 95% Coverage	0.95
Approx, f used to compute achieved CC	0.474	Approximate Actual Confidence Coefficient achieved by U	0.37
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.95	95% BCA Bootstrap UTL with 95% Coverage	0.95
95% UPL	0.95	90% Percentile	0.51
90% Chebyshev UPL	1.199	95% Percentile	0.73
95% Chebyshev UPL	1.63	99% Percentile	0.906
95% USL	0.95		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_SVOCs|Chrysene|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
Minimum	0.0275	First Quartile	0.0333
Second Largest	0.38	Median	0.046
Maximum	0.97	Third Quartile	0.228
Mean	0.2	SD	0.296
Coefficient of Variation	1.478	Skewness	2.341
Mean of logged Data	-2.403	SD of logged Data	1.27

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.657	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.294	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.061	90% Percentile (z)	0.579
95% UPL (t)	0.769	95% Percentile (z)	0.687
95% USL	0.844	99% Percentile (z)	0.888

Gamma GOF Test

A-D Test Statistic	0.898	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.757	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.315	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.276	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.754	k star (bias corrected MLE)	0.594
Theta hat (MLE)	0.265	Theta star (bias corrected MLE)	0.337
nu hat (MLE)	15.08	nu star (bias corrected)	11.89
MLE Mean (bias corrected)	0.2	MLE Sd (bias corrected)	0.259

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.819	90% Percentile	0.521
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.849	95% Percentile	0.722
95% WH Approx. Gamma UTL with 95% Coverage	1.58	99% Percentile	1.209
95% HW Approx. Gamma UTL with 95% Coverage	1.795		
95% WH USL	0.983	95% HW USL	1.043

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.843	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.28	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Lognormal at 5% Significance Level	

Data appear Approximate Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	3.645	90% Percentile (z)	0.46
95% UPL (t)	1.039	95% Percentile (z)	0.73
95% USL	1.434	99% Percentile (z)	1.735

Nonparametric Distribution Free Background Statistics

Data appear Approximate Lognormal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	0.97
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.97	95% BCA Bootstrap UTL with 95% Coverage	0.97
95% UPL	0.97	90% Percentile	0.439
90% Chebyshev UPL	1.131	95% Percentile	0.704
95% Chebyshev UPL	1.552	99% Percentile	0.917
95% USL	0.97		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_SVOCs|Pyrene|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	0.041	First Quartile	0.062
Second Largest	0.65	Median	0.114
Maximum	1.4	Third Quartile	0.538
Mean	0.358	SD	0.436
Coefficient of Variation	1.218	Skewness	1.719
Mean of logged Data	-1.726	SD of logged Data	1.273

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.754	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.3	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.628	90% Percentile (z)	0.917
95% UPL (t)	1.197	95% Percentile (z)	1.076
95% USL	1.308	99% Percentile (z)	1.373

Gamma GOF Test

A-D Test Statistic	0.657	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.754	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.259	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.275	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.843	k star (bias corrected MLE)	0.657
Theta hat (MLE)	0.425	Theta star (bias corrected MLE)	0.546
nu hat (MLE)	16.86	nu star (bias corrected)	13.13
MLE Mean (bias corrected)	0.358	MLE Sd (bias corrected)	0.442

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1.434	90% Percentile	0.913
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.522	95% Percentile	1.248
95% WH Approx. Gamma UTL with 95% Coverage	2.705	99% Percentile	2.052
95% HW Approx. Gamma UTL with 95% Coverage	3.146		
95% WH USL	1.71	95% HW USL	1.857

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.891	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.204	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	7.233	90% Percentile (z)	0.909
95% UPL (t)	2.056	95% Percentile (z)	1.444
95% USL	2.839	99% Percentile (z)	3.437

Nonparametric Distribution Free Background Statistics
Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	1.4
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.4	95% BCA Bootstrap UTL with 95% Coverage	1.4
95% UPL	1.4	90% Percentile	0.725
90% Chebyshev UPL	1.731	95% Percentile	1.063
95% Chebyshev UPL	2.353	99% Percentile	1.333
95% USL	1.4		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_SVOCs|Total High MW PAHs|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
Minimum	0.2	First Quartile	0.298
Second Largest	2.6	Median	0.475
Maximum	6.2	Third Quartile	2.4
Mean	1.547	SD	1.907
Coefficient of Variation	1.233	Skewness	1.847
Mean of logged Data	-0.23	SD of logged Data	1.22

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.736	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.301	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	7.098	90% Percentile (z)	3.991
95% UPL (t)	5.213	95% Percentile (z)	4.684
95% USL	5.697	99% Percentile (z)	5.983

Gamma GOF Test

A-D Test Statistic	0.721	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.752	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.278	Kolmogorov-Smirnov Gamma GOF Test	

5% K-S Critical Value	0.275	Data Not Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.879	k star (bias corrected MLE)	0.682
Theta hat (MLE)	1.759	Theta star (bias corrected MLE)	2.268
nu hat (MLE)	17.59	nu star (bias corrected)	13.64
MLE Mean (bias corrected)	1.547	MLE Sd (bias corrected)	1.873

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	6.075	90% Percentile	3.907
95% Hawkins Wixley (HW) Approx. Gamma UPL	6.396	95% Percentile	5.315
95% WH Approx. Gamma UTL with 95% Coverage	11.37	99% Percentile	8.683
95% HW Approx. Gamma UTL with 95% Coverage	13.06		
95% WH USL	7.226	95% HW USL	7.778

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.882	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.224	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	27.7	90% Percentile (z)	3.793
95% UPL (t)	8.292	95% Percentile (z)	5.909
95% USL	11.3	99% Percentile (z)	13.57

Nonparametric Distribution Free Background Statistics

Data appear Approximate Gamma Distribution at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	6.2
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	6.2	95% BCA Bootstrap UTL with 95% Coverage	6.2
95% UPL	6.2	90% Percentile	2.96
90% Chebyshev UPL	7.547	95% Percentile	4.58
95% Chebyshev UPL	10.26	99% Percentile	5.876
95% USL	6.2		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_SVOCs|Total PAHs|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
Minimum	0.26	First Quartile	0.345
Second Largest	3	Median	0.56
Maximum	6.7	Third Quartile	2.7
Mean	1.736	SD	2.067

Coefficient of Variation	1.191	Skewness	1.751
Mean of logged Data	-0.0759	SD of logged Data	1.182

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.747	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.304	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	7.754	90% Percentile (z)	4.386
95% UPL (t)	5.711	95% Percentile (z)	5.137
95% USL	6.235	99% Percentile (z)	6.546

Gamma GOF Test

A-D Test Statistic	0.744	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.751	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.28	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.274	Data Not Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.928	k star (bias corrected MLE)	0.716
Theta hat (MLE)	1.87	Theta star (bias corrected MLE)	2.423
nu hat (MLE)	18.56	nu star (bias corrected)	14.33
MLE Mean (bias corrected)	1.736	MLE Sd (bias corrected)	2.051

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	6.685	90% Percentile	4.334
95% Hawkins Wixley (HW) Approx. Gamma UPL	7.028	95% Percentile	5.86
95% WH Approx. Gamma UTL with 95% Coverage	12.38	99% Percentile	9.495
95% HW Approx. Gamma UTL with 95% Coverage	14.16		
95% WH USL	7.927	95% HW USL	8.513

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.87	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.228	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	28.91	90% Percentile (z)	4.215
95% UPL (t)	8.99	95% Percentile (z)	6.475
95% USL	12.13	99% Percentile (z)	14.49

Nonparametric Distribution Free Background Statistics

Data appear Approximate Gamma Distribution at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	6.7

Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	6.7	95% BCA Bootstrap UTL with 95% Coverage	6.7
95% UPL	6.7	90% Percentile	3.37
90% Chebyshev UPL	8.241	95% Percentile	5.035
95% Chebyshev UPL	11.19	99% Percentile	6.367
95% USL	6.7		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	ProUCL 5.19/24/2020 3:15:39 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Total Number of Observations	8	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	1	First Quartile	1.6
Second Largest	2.2	Median	1.75
Maximum	2.54	Third Quartile	2.05
Mean	1.805	SD	0.459
Coefficient of Variation	0.255	Skewness	-0.145
Mean of logged Data	0.559	SD of logged Data	0.278

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.187	d2max (for USL)	2.032

Normal GOF Test

Shapiro Wilk Test Statistic	0.97	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.818	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.203	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.283	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	3.269	90% Percentile (z)	2.394
95% UPL (t)	2.728	95% Percentile (z)	2.561
95% USL	2.738	99% Percentile (z)	2.874

Gamma GOF Test

A-D Test Statistic	0.29	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.716	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.224	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.294	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	16.02	k star (bias corrected MLE)	10.1
Theta hat (MLE)	0.113	Theta star (bias corrected MLE)	0.179
nu hat (MLE)	256.3	nu star (bias corrected)	161.5
MLE Mean (bias corrected)	1.805	MLE Sd (bias corrected)	0.568

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	2.906	90% Percentile	2.561
95% Hawkins Wixley (HW) Approx. Gamma UPL	2.938	95% Percentile	2.83
95% WH Approx. Gamma UTL with 95% Coverage	3.757	99% Percentile	3.382

95% HW Approx. Gamma UTL with	95% Coverage	3.854			
	95% WH USL	2.921		95% HW USL	2.954

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.818	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.249	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.283	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	4.238		90% Percentile (z)	2.497
	95% UPL (t)	3.056		95% Percentile (z)	2.762
	95% USL	3.075		99% Percentile (z)	3.337

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		8	95% UTL with	95% Coverage	2.54
Approx, f used to compute achieved CC		0.421	pproximate Actual Confidence Coefficient achieved by UTL		0.337
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	2.54	95% BCA Bootstrap UTL with	95% Coverage	2.54
	95% UPL	2.54		90% Percentile	2.302
	90% Chebyshev UPL	3.267		95% Percentile	2.421
	95% Chebyshev UPL	3.929		99% Percentile	2.516
	95% USL	2.54			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Chromium

General Statistics

Total Number of Observations	9	Number of Distinct Observations	8
		Number of Missing Observations	1
Minimum	5.3	First Quartile	8.04
Second Largest	11.5	Median	8.38
Maximum	11.5	Third Quartile	9.22
Mean	8.727	SD	1.931
Coefficient of Variation	0.221	Skewness	0.0038
Mean of logged Data	2.143	SD of logged Data	0.233

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.177	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	14.58	90% Percentile (z)	11.2
	95% UPL (t)	12.51	95% Percentile (z)	11.9
	95% USL	12.8	99% Percentile (z)	13.22

Gamma GOF Test

A-D Test Statistic	0.383	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.721	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.158	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.279	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	21.74	k star (bias corrected MLE)	14.57
Theta hat (MLE)	0.401	Theta star (bias corrected MLE)	0.599
nu hat (MLE)	391.3	nu star (bias corrected)	262.2
MLE Mean (bias corrected)	8.727	MLE Sd (bias corrected)	2.287

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	13.05	90% Percentile	11.76
95% Hawkins Wixley (HW) Approx. Gamma UPL	13.14	95% Percentile	12.8
95% WH Approx. Gamma UTL with 95% Coverage	16.03	99% Percentile	14.91
95% HW Approx. Gamma UTL with 95% Coverage	16.3		
95% WH USL	13.44	95% HW USL	13.55

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.912	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.18	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	17.29	90% Percentile (z)	11.5
	95% UPL (t)	13.47	95% Percentile (z)	12.51
	95% USL	13.95	99% Percentile (z)	14.67

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		9	95% UTL with 95% Coverage	11.5
Approx, f used to compute achieved CC		0.474	pproximate Actual Confidence Coefficient achieved by UTL	0.37
			Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with	95% Coverage	11.5	95% BCA Bootstrap UTL with 95% Coverage	11.5
	95% UPL	11.5	90% Percentile	11.5
	90% Chebyshev UPL	14.83	95% Percentile	11.5
	95% Chebyshev UPL	17.6	99% Percentile	11.5
	95% USL	11.5		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data

represents a background data set and when many onsite observations need to be compared with the BTV.

Cobalt

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	1
Minimum	1.34	First Quartile	1.79
Second Largest	2.51	Median	1.91
Maximum	2.67	Third Quartile	2.22
Mean	1.996	SD	0.409
Coefficient of Variation	0.205	Skewness	0.337
Mean of logged Data	0.672	SD of logged Data	0.207

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.945	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.221	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	3.236	90% Percentile (z)	2.52
95% UPL (t)	2.798	95% Percentile (z)	2.669
95% USL	2.859	99% Percentile (z)	2.948

Gamma GOF Test

A-D Test Statistic	0.321	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.721	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.199	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.279	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	26.66	k star (bias corrected MLE)	17.85
Theta hat (MLE)	0.0748	Theta star (bias corrected MLE)	0.112
nu hat (MLE)	479.9	nu star (bias corrected)	321.3
MLE Mean (bias corrected)	1.996	MLE Sd (bias corrected)	0.472

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	2.88	90% Percentile	2.62
95% Hawkins Wixley (HW) Approx. Gamma UPL	2.893	95% Percentile	2.831
95% WH Approx. Gamma UTL with 95% Coverage	3.478	99% Percentile	3.255
95% HW Approx. Gamma UTL with 95% Coverage	3.519		
95% WH USL	2.959	95% HW USL	2.975

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.949	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.185	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	3.669	90% Percentile (z)	2.554
	95% UPL (t)	2.939	95% Percentile (z)	2.753
	95% USL	3.032	99% Percentile (z)	3.171

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		9	95% UTL with 95% Coverage	2.67
Approx, f used to compute achieved CC		0.474	pproximate Actual Confidence Coefficient achieved by UTL	0.37
			Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with	95% Coverage	2.67	95% BCA Bootstrap UTL with 95% Coverage	2.67
	95% UPL	2.67	90% Percentile	2.542
	90% Chebyshev UPL	3.29	95% Percentile	2.606
	95% Chebyshev UPL	3.876	99% Percentile	2.657
	95% USL	2.67		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Cu

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	1
Minimum	3.58	First Quartile	5.22
Second Largest	7.46	Median	5.46
Maximum	8.45	Third Quartile	7.03
Mean	5.899	SD	1.585
Coefficient of Variation	0.269	Skewness	0.113
Mean of logged Data	1.741	SD of logged Data	0.28

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.972	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.165	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	10.7	90% Percentile (z)	7.931
	95% UPL (t)	9.006	95% Percentile (z)	8.507
	95% USL	9.243	99% Percentile (z)	9.587

Gamma GOF Test

A-D Test Statistic	0.212	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.721	Detected data appear Gamma Distributed at 5% Significance Level

K-S Test Statistic	0.138	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.279	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	14.96	k star (bias corrected MLE)	10.04
Theta hat (MLE)	0.394	Theta star (bias corrected MLE)	0.587
nu hat (MLE)	269.2	nu star (bias corrected)	180.8
MLE Mean (bias corrected)	5.899	MLE Sd (bias corrected)	1.861

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	9.493	90% Percentile	8.374
95% Hawkins Wixley (HW) Approx. Gamma UPL	9.578	95% Percentile	9.256
95% WH Approx. Gamma UTL with 95% Coverage	12.08	99% Percentile	11.07
95% HW Approx. Gamma UTL with 95% Coverage	12.34		
95% WH USL	9.829	95% HW USL	9.932

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.962	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.154	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	13.33	90% Percentile (z)	8.167
95% UPL (t)	9.877	95% Percentile (z)	9.042
95% USL	10.3	99% Percentile (z)	10.94

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with 95% Coverage	8.45
Approx, f used to compute achieved CC	0.474	pproximate Actual Confidence Coefficient achieved by UTL	0.37
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	8.45	95% BCA Bootstrap UTL with 95% Coverage	8.45
95% UPL	8.45	90% Percentile	7.658
90% Chebyshev UPL	10.91	95% Percentile	8.054
95% Chebyshev UPL	13.18	99% Percentile	8.371
95% USL	8.45		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Fe

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	1
Minimum	4740	First Quartile	6320
Second Largest	8870	Median	6950

Maximum	11100	Third Quartile	8740
Mean	7384	SD	1902
Coefficient of Variation	0.258	Skewness	0.788
Mean of logged Data	8.879	SD of logged Data	0.252

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.947	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.197	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	13149	90% Percentile (z)	9822
	95% UPL (t)	11113	95% Percentile (z)	10513
	95% USL	11397	99% Percentile (z)	11809

Gamma GOF Test

A-D Test Statistic	0.232	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.721	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.168	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.279	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	17.75	k star (bias corrected MLE)	11.91
Theta hat (MLE)	416	Theta star (bias corrected MLE)	620.1
nu hat (MLE)	319.5	nu star (bias corrected)	214.4
MLE Mean (bias corrected)	7384	MLE Sd (bias corrected)	2140

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		11473	90% Percentile	10225
95% Hawkins Wixley (HW) Approx. Gamma UPL		11535	95% Percentile	11220
95% WH Approx. Gamma UTL with	95% Coverage	14357	99% Percentile	13250
95% HW Approx. Gamma UTL with	95% Coverage	14577		
	95% WH USL	11850	95% HW USL	11928

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.978	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.153	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	15391	90% Percentile (z)	9909
	95% UPL (t)	11755	95% Percentile (z)	10858
	95% USL	12205	99% Percentile (z)	12890

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9		95% UTL with	95% Coverage	11100
Approx, f used to compute achieved CC	0.474		Approximate Actual Confidence Coefficient achieved by UTL		0.37
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	11100	95% BCA Bootstrap UTL with	95% Coverage	11100
	95% UPL	11100		90% Percentile	9316
	90% Chebyshev UPL	13399		95% Percentile	10208
	95% Chebyshev UPL	16123		99% Percentile	10922
	95% USL	11100			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Mn

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	1
Minimum	55.6	First Quartile	69
Second Largest	85.4	Median	72.8
Maximum	90.5	Third Quartile	75.4
Mean	72.79	SD	10.67
Coefficient of Variation	0.147	Skewness	0.16
Mean of logged Data	4.278	SD of logged Data	0.148

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.969	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	105.1	90% Percentile (z)	86.47
	95% UPL (t)	93.71	95% Percentile (z)	90.34
	95% USL	95.3	99% Percentile (z)	97.62

Gamma GOF Test

A-D Test Statistic	0.227	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.72	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.159	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.279	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	51.9	k star (bias corrected MLE)	34.68
Theta hat (MLE)	1.402	Theta star (bias corrected MLE)	2.099
nu hat (MLE)	934.3	nu star (bias corrected)	624.2
MLE Mean (bias corrected)	72.79	MLE Sd (bias corrected)	12.36

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	95.32	90% Percentile	89.01
95% Hawkins Wixley (HW) Approx. Gamma UPL	95.57	95% Percentile	94.24
95% WH Approx. Gamma UTL with 95% Coverage	109.7	99% Percentile	104.6
95% HW Approx. Gamma UTL with 95% Coverage	110.5		
95% WH USL	97.25	95% HW USL	97.55

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.97	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.162	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	112.9	90% Percentile (z)	87.16
95% UPL (t)	96.37	95% Percentile (z)	91.98
95% USL	98.53	99% Percentile (z)	101.7

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with 95% Coverage	90.5
Approx, f used to compute achieved CC	0.474	Approximate Actual Confidence Coefficient achieved by UTL	0.37
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	90.5	95% BCA Bootstrap UTL with 95% Coverage	90.5
95% UPL	90.5	90% Percentile	86.42
90% Chebyshev UPL	106.5	95% Percentile	88.46
95% Chebyshev UPL	121.8	99% Percentile	90.09
95% USL	90.5		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/22/2020 1:19:39 PM
From File	HS_Input.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

RA_HS_SVOCs|Dibenzo(a,h)Anthracene|mg/kg

General Statistics

Total Number of Observations	10	Number of Missing Observations	0
Number of Distinct Observations	10		
Number of Detects	9	Number of Non-Detects	1
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	0.0039	Minimum Non-Detect	0.015
Maximum Detect	0.054	Maximum Non-Detect	0.015
Variance Detected	4.1689E-4	Percent Non-Detects	10%
Mean Detected	0.0224	SD Detected	0.0204
Mean of Detected Logged Data	-4.27	SD of Detected Logged Data	1.07

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.811	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.299	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0207	KM SD	0.0189
95% UTL95% Coverage	0.0758	95% KM UPL (t)	0.0571
90% KM Percentile (z)	0.045	95% KM Percentile (z)	0.0518
99% KM Percentile (z)	0.0647	95% KM USL	0.0619

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0209	SD	0.0198
95% UTL95% Coverage	0.0786	95% UPL (t)	0.059
90% Percentile (z)	0.0463	95% Percentile (z)	0.0535
99% Percentile (z)	0.067	95% USL	0.064

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.784	Anderson-Darling GOF Test	
5% A-D Critical Value	0.74	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.263	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.286	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.206	k star (bias corrected MLE)	0.878
Theta hat (MLE)	0.0185	Theta star (bias corrected MLE)	0.0255
nu hat (MLE)	21.7	nu star (bias corrected)	15.8
MLE Mean (bias corrected)	0.0224		
MLE Sd (bias corrected)	0.0239	95% Percentile of Chisquare (2kstar)	5.509

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0039	Mean	0.0211
Maximum	0.054	Median	0.0095
SD	0.0196	CV	0.93
k hat (MLE)	1.263	k star (bias corrected MLE)	0.951
Theta hat (MLE)	0.0167	Theta star (bias corrected MLE)	0.0222
nu hat (MLE)	25.26	nu star (bias corrected)	19.01
MLE Mean (bias corrected)	0.0211	MLE Sd (bias corrected)	0.0217
95% Percentile of Chisquare (2kstar)	5.799	90% Percentile	0.0492
95% Percentile	0.0644	99% Percentile	0.0998

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.127	0.143	95% Approx. Gamma UPL	0.0727	0.0764
95% Gamma USL	0.0847	0.0906			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0207	SD (KM)	0.0189
Variance (KM)	3.5774E-4	SE of Mean (KM)	0.00635
k hat (KM)	1.201	k star (KM)	0.907
nu hat (KM)	24.01	nu star (KM)	18.14
theta hat (KM)	0.0173	theta star (KM)	0.0228
80% gamma percentile (KM)	0.0336	90% gamma percentile (KM)	0.0489
95% gamma percentile (KM)	0.0643	99% gamma percentile (KM)	0.1

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.12	0.134	95% Approx. Gamma UPL	0.0688	0.0719
95% KM Gamma Percentile	0.0576	0.0591	95% Gamma USL	0.0801	0.0852

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.839	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.235	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0208	Mean in Log Scale	-4.339
SD in Original Scale	0.0199	SD in Log Scale	1.032
95% UTL95% Coverage	0.263	95% BCA UTL95% Coverage	0.054

95% Bootstrap (%) UTL95% Coverage	0.054	95% UPL (t)	0.095
90% Percentile (z)	0.049	95% Percentile (z)	0.0713
99% Percentile (z)	0.144	95% USL	0.123

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-4.357	95% KM UTL (Lognormal)95% Coverage	0.233
KM SD of Logged Data	0.996	95% KM UPL (Lognormal)	0.087
95% KM Percentile Lognormal (z)	0.0659	95% KM USL (Lognormal)	0.112

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0209	Mean in Log Scale	-4.332
SD in Original Scale	0.0198	SD in Log Scale	1.028
95% UTL95% Coverage	0.262	95% UPL (t)	0.0948
90% Percentile (z)	0.0491	95% Percentile (z)	0.0713
99% Percentile (z)	0.144	95% USL	0.123

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	10	95% UTL with95% Coverage	0.054
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.054
95% USL	0.054	95% KM Chebyshev UPL	0.107

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_SVOCs|Naphthalene|mg/kg

General Statistics

Total Number of Observations	10	Number of Missing Observations	0
Number of Distinct Observations	9		
Number of Detects	8	Number of Non-Detects	2
Number of Distinct Detects	7	Number of Distinct Non-Detects	2
Minimum Detect	0.0041	Minimum Non-Detect	0.014
Maximum Detect	0.016	Maximum Non-Detect	0.015
Variance Detected	2.4267E-5	Percent Non-Detects	20%
Mean Detected	0.00831	SD Detected	0.00493
Mean of Detected Logged Data	-4.925	SD of Detected Logged Data	0.535

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.764	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.275	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0078	KM SD	0.00429
95% UTL95% Coverage	0.0203	95% KM UPL (t)	0.0161
90% KM Percentile (z)	0.0133	95% KM Percentile (z)	0.0149
99% KM Percentile (z)	0.0178	95% KM USL	0.0171

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0081	SD	0.00437
95% UTL95% Coverage	0.0208	95% UPL (t)	0.0165
90% Percentile (z)	0.0137	95% Percentile (z)	0.0153
99% Percentile (z)	0.0183	95% USL	0.0176

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.706	Anderson-Darling GOF Test	
5% A-D Critical Value	0.719	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.252	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.295	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.868	k star (bias corrected MLE)	2.501
Theta hat (MLE)	0.00215	Theta star (bias corrected MLE)	0.00332
nu hat (MLE)	61.89	nu star (bias corrected)	40.02
MLE Mean (bias corrected)	0.00831		
MLE Sd (bias corrected)	0.00526	95% Percentile of Chisquare (2kstar)	11.07

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0041	Mean	0.00865
Maximum	0.016	Median	0.0077
SD	0.0044	CV	0.509
k hat (MLE)	4.678	k star (bias corrected MLE)	3.342
Theta hat (MLE)	0.00185	Theta star (bias corrected MLE)	0.00259
nu hat (MLE)	93.57	nu star (bias corrected)	66.83
MLE Mean (bias corrected)	0.00865	MLE Sd (bias corrected)	0.00473
95% Percentile of Chisquare (2kstar)	13.6	90% Percentile	0.015
95% Percentile	0.0176	99% Percentile	0.0232

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.0263	0.0274	95% Approx. Gamma UPL	0.0185	0.0188
95% Gamma USL	0.0203	0.0208			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0078	SD (KM)	0.00429
Variance (KM)	1.8447E-5	SE of Mean (KM)	0.00147
k hat (KM)	3.298	k star (KM)	2.375
nu hat (KM)	65.96	nu star (KM)	47.51

theta hat (KM)	0.00236	theta star (KM)	0.00328
80% gamma percentile (KM)	0.0114	90% gamma percentile (KM)	0.0146
95% gamma percentile (KM)	0.0175	99% gamma percentile (KM)	0.024

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverag	0.0236	0.0243	95% Approx. Gamma UPL	0.0166	0.0167
95% KM Gamma Percentile	0.0149	0.0149	95% Gamma USL	0.0182	0.0184

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.851	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.234	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.00784	Mean in Log Scale	-4.965
SD in Original Scale	0.00446	SD in Log Scale	0.48
95% UTL95% Coverage	0.0282	95% BCA UTL95% Coverage	0.016
95% Bootstrap (%) UTL95% Coverage	0.016	95% UPL (t)	0.0176
90% Percentile (z)	0.0129	95% Percentile (z)	0.0154
99% Percentile (z)	0.0213	95% USL	0.0198

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-4.977	95% KM UTL (Lognormal)95% Coverage	0.0273
KM SD of Logged Data	0.472	95% KM UPL (Lognormal)	0.0171
95% KM Percentile Lognormal (z)	0.015	95% KM USL (Lognormal)	0.0193

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0081	Mean in Log Scale	-4.925
SD in Original Scale	0.00437	SD in Log Scale	0.472
95% UTL95% Coverage	0.0287	95% UPL (t)	0.018
90% Percentile (z)	0.0133	95% Percentile (z)	0.0158
99% Percentile (z)	0.0218	95% USL	0.0203

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	10	95% UTL with95% Coverage	0.016
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
Approximate Sample Size needed to achieve specified C	59	95% UPL	0.016
95% USL	0.016	95% KM Chebyshev UPL	0.0274

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.19/22/2020 1:21:33 PM
From File	C:\Users\scesnyc\Desktop\DeskTop Folder\Blue Beach\Input\HS_Input.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

RA_HS_Metals|Aluminum|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	3210	First Quartile	4380
Second Largest	9890	Median	5160
Maximum	10800	Third Quartile	7435
Mean	6097	SD	2584
Coefficient of Variation	0.424	Skewness	0.999
Mean of logged Data	8.642	SD of logged Data	0.396

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.857	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.3	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	13619	90% Percentile (z)	9409
95% UPL (t)	11065	95% Percentile (z)	10347
95% USL	11720	99% Percentile (z)	12108

Gamma GOF Test

A-D Test Statistic	0.541	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.728	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.266	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	6.95	k star (bias corrected MLE)	4.931
Theta hat (MLE)	877.3	Theta star (bias corrected MLE)	1236
nu hat (MLE)	139	nu star (bias corrected)	98.63
MLE Mean (bias corrected)	6097	MLE Sd (bias corrected)	2746

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	11627	90% Percentile	9773
95% Hawkins Wixley (HW) Approx. Gamma UPL	11734	95% Percentile	11200
95% WH Approx. Gamma UTL with 95% Coverage	15745	99% Percentile	14218
95% HW Approx. Gamma UTL with 95% Coverage	16181		

95% WH USL	12605	95% HW USL	12774

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.241	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	17948	90% Percentile (z)	9411
95% UPL (t)	12132	95% Percentile (z)	10868
95% USL	13414	99% Percentile (z)	14237

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	10800
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	10800	95% BCA Bootstrap UTL with 95% Coverage	10800
95% UPL	10800	90% Percentile	9981
90% Chebyshev UPL	14227	95% Percentile	10391
95% Chebyshev UPL	17910	99% Percentile	10718
95% USL	10800		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

RA_HS_Metals|Vanadium|mg/kg

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
Minimum	6.38	First Quartile	8.74
Second Largest	20.1	Median	9.95
Maximum	24	Third Quartile	15.6
Mean	12.51	SD	5.842
Coefficient of Variation	0.467	Skewness	1.07
Mean of logged Data	2.438	SD of logged Data	0.434

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.911	d2max (for USL)	2.176

Normal GOF Test

Shapiro Wilk Test Statistic	0.873	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.268	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	29.52	90% Percentile (z)	20
95% UPL (t)	23.75	95% Percentile (z)	22.12
95% USL	25.23	99% Percentile (z)	26.1

Gamma GOF Test

A-D Test Statistic	0.428	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.729	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.249	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.797	k star (bias corrected MLE)	4.125
Theta hat (MLE)	2.159	Theta star (bias corrected MLE)	3.034
nu hat (MLE)	115.9	nu star (bias corrected)	82.5
MLE Mean (bias corrected)	12.51	MLE Sd (bias corrected)	6.162

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	25.1	90% Percentile	20.77
95% Hawkins Wixley (HW) Approx. Gamma UPL	25.37	95% Percentile	24.06
95% WH Approx. Gamma UTL with 95% Coverage	34.75	99% Percentile	31.08
95% HW Approx. Gamma UTL with 95% Coverage	35.86		
95% WH USL	27.38	95% HW USL	27.8

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.941	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.224	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	40.53	90% Percentile (z)	19.98
95% UPL (t)	26.39	95% Percentile (z)	23.39
95% USL	29.46	99% Percentile (z)	31.45

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10	95% UTL with 95% Coverage	24
Approx, f used to compute achieved CC	0.526	Approximate Actual Confidence Coefficient achieved by U	0.401
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	24	95% BCA Bootstrap UTL with 95% Coverage	24
95% UPL	24	90% Percentile	20.49
90% Chebyshev UPL	30.9	95% Percentile	22.25
95% Chebyshev UPL	39.22	99% Percentile	23.65
95% USL	24		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Attachment D-1
BTV Output
Hydric Subsurface Soil

Background Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	ProUCL 5.19/24/2020 3:24:59 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Total Number of Observations	9	Number of Distinct Observations	7
		Number of Missing Observations	1
Minimum	0.66	First Quartile	1.1
Second Largest	3	Median	1.3
Maximum	3.55	Third Quartile	1.7
Mean	1.69	SD	0.953
Coefficient of Variation	0.564	Skewness	1.308
Mean of logged Data	0.4	SD of logged Data	0.518

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.829	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.274	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	4.58	90% Percentile (z)	2.912
95% UPL (t)	3.559	95% Percentile (z)	3.258
95% USL	3.701	99% Percentile (z)	3.908

Gamma GOF Test

A-D Test Statistic	0.508	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.208	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.28	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	4.173	k star (bias corrected MLE)	2.856
Theta hat (MLE)	0.405	Theta star (bias corrected MLE)	0.592
nu hat (MLE)	75.12	nu star (bias corrected)	51.41
MLE Mean (bias corrected)	1.69	MLE Sd (bias corrected)	1

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	3.815	90% Percentile	3.031
95% Hawkins Wixley (HW) Approx. Gamma UPL	3.873	95% Percentile	3.597

95% WH Approx. Gamma UTL with	95% Coverage	5.672	99% Percentile	4.829
95% HW Approx. Gamma UTL with	95% Coverage	5.936		
	95% WH USL	4.045	95% HW USL	4.122

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.934	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.178	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	7.169	90% Percentile (z)	2.897
	95% UPL (t)	4.117	95% Percentile (z)	3.497
	95% USL	4.449	99% Percentile (z)	4.977

Nonparametric Distribution Free Background Statistics
Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	9	95% UTL with	95% Coverage	3.55
Approx, f used to compute achieved CC	0.474	roximate Actual Confidence Coefficient achieved by UTL		0.37
		pproximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	3.55	95% BCA Bootstrap UTL with 95% Coverage	3.55
	95% UPL	3.55	90% Percentile	3.11
	90% Chebyshev UPL	4.705	95% Percentile	3.33
	95% Chebyshev UPL	6.071	99% Percentile	3.506
	95% USL	3.55		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Cobalt

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	1
Minimum	1.45	First Quartile	1.6
Second Largest	2.51	Median	1.71
Maximum	2.55	Third Quartile	1.9
Mean	1.851	SD	0.409
Coefficient of Variation	0.221	Skewness	1.154
Mean of logged Data	0.596	SD of logged Data	0.206

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.822	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.23	**Lilliefors GOF Test**	

5% Lilliefors Critical Value	0.274	Data appear Normal at 5% Significance Level

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with	95% Coverage	3.092	90% Percentile (z)	2.376
	95% UPL (t)	2.653	95% Percentile (z)	2.524
	95% USL	2.715	99% Percentile (z)	2.803

Gamma GOF Test

A-D Test Statistic	0.642	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.721	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.199	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.279	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	25.46	k star (bias corrected MLE)	17.05
Theta hat (MLE)	0.0727	Theta star (bias corrected MLE)	0.109
nu hat (MLE)	458.2	nu star (bias corrected)	306.8
MLE Mean (bias corrected)	1.851	MLE Sd (bias corrected)	0.448

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL		2.692	90% Percentile	2.444
95% Hawkins Wixley (HW) Approx. Gamma UPL		2.698	95% Percentile	2.645
95% WH Approx. Gamma UTL with	95% Coverage	3.263	99% Percentile	3.05
95% HW Approx. Gamma UTL with	95% Coverage	3.291		
	95% WH USL	2.767	95% HW USL	2.775

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.865	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.19	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	3.388	90% Percentile (z)	2.363
	95% UPL (t)	2.718	95% Percentile (z)	2.547
	95% USL	2.803	99% Percentile (z)	2.931

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r		9	95% UTL with 95% Coverage	2.55
Approx, f used to compute achieved CC		0.474	roximate Actual Confidence Coefficient achieved by UTL	0.37
			pproximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with	95% Coverage	2.55	95% BCA Bootstrap UTL with 95% Coverage	2.55
	95% UPL	2.55	90% Percentile	2.518
	90% Chebyshev UPL	3.145	95% Percentile	2.534
	95% Chebyshev UPL	3.732	99% Percentile	2.547
	95% USL	2.55		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.

Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Iron

General Statistics

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	1
Minimum	4680	First Quartile	5340
Second Largest	8920	Median	6120
Maximum	10700	Third Quartile	6400
Mean	6628	SD	1939
Coefficient of Variation	0.293	Skewness	1.475
Mean of logged Data	8.766	SD of logged Data	0.263

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.031	d2max (for USL)	2.11

Normal GOF Test

Shapiro Wilk Test Statistic	0.819	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.325	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.274	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	12504	90% Percentile (z)	9112
95% UPL (t)	10428	95% Percentile (z)	9817
95% USL	10718	99% Percentile (z)	11138

Gamma GOF Test

A-D Test Statistic	0.665	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.721	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.298	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.279	Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	15.37	k star (bias corrected MLE)	10.32
Theta hat (MLE)	431.3	Theta star (bias corrected MLE)	642.4
nu hat (MLE)	276.6	nu star (bias corrected)	185.7
MLE Mean (bias corrected)	6628	MLE Sd (bias corrected)	2063

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	10598	90% Percentile	9371
95% Hawkins Wixley (HW) Approx. Gamma UPL	10628	95% Percentile	10346
95% WH Approx. Gamma UTL with 95% Coverage	13448	99% Percentile	12345
95% HW Approx. Gamma UTL with 95% Coverage	13615		
95% WH USL	10969	95% HW USL	11012

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.882	**Shapiro Wilk Lognormal GOF Test**

5% Shapiro Wilk Critical Value	0.829	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.281	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.274	Data Not Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with	95% Coverage	14222	90% Percentile (z)	8981
	95% UPL (t)	10734	95% Percentile (z)	9881
	95% USL	11164	99% Percentile (z)	11818

Nonparametric Distribution Free Background Statistics

Data appear Approximate Gamma Distribution at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

	Order of Statistic, r	9	95% UTL with	95% Coverage	10700
	Approx, f used to compute achieved CC	0.474	Approximate Actual Confidence Coefficient achieved by UTL		0.37
			Approximate Sample Size needed to achieve specified CC		59
95% Percentile Bootstrap UTL with	95% Coverage	10700	95% BCA Bootstrap UTL with	95% Coverage	10700
	95% UPL	10700		90% Percentile	9276
	90% Chebyshev UPL	12759		95% Percentile	9988
	95% Chebyshev UPL	15536		99% Percentile	10558
	95% USL	10700			

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

t-Test Sample 1 vs Sample 2 Comparison for Uncensored Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/23/2020 9:03:20 AM
From File	HypTest_Input_SS_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Sample 1 Mean <= Sample 2 Mean (Form 1)
Alternative Hypothesis	Sample 1 Mean > the Sample 2 Mean

Sample 1 Data: SITE_SO_Metals|Cobalt|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_Metals|Cobalt|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	27	20
Number of Distinct Observations	26	20
Minimum	1.3	1.63
Maximum	7.57	6.32
Mean	2.917	3.287
Median	2.68	3.08
SD	1.243	1.071
SE of Mean	0.239	0.24

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	45	-1.068	1.679	0.854
Welch-Satterthwaite (Unequal Va	43.9	-1.093	1.68	0.86

Pooled SD 1.174
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Do Not Reject H0, Conclude Sample 1 <= Sample 2
Welch-Satterthwaite Test: Do Not Reject H0, Conclude Sample 1 <= Sample 2

Test of Equality of Variances

Variance of Sample 1	1.546
Variance of Sample 2	1.147

Numerator DF	Denominator DF	F-Test Value	P-Value
26	19	1.347	0.508

Conclusion with Alpha = 0.05
Two variances appear to be equal

Sample 1 Data: SITE_SO_Metals|Manganese|mg/kg(so-onproject_bluebeach)

Sample 2 Data: SITE_SO_Metals|Manganese|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	27	20
Number of Distinct Observations	23	19
Minimum	54.6	85.9
Maximum	248	207
Mean	106.7	133.5
Median	96.9	128.5
SD	38.05	35.76
SE of Mean	7.322	7.997

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	45	-2.447	1.679	0.991
Welch-Satterthwaite (Unequal Va	42.4	-2.47	1.682	0.991

Pooled SD 37.099

Conclusion with Alpha = 0.050

Student t (Pooled) Test: Do Not Reject H0, Conclude Sample 1 <= Sample 2

Welch-Satterthwaite Test: Do Not Reject H0, Conclude Sample 1 <= Sample 2

Test of Equality of Variances

Variance of Sample 1	1447
Variance of Sample 2	1279

Numerator DF	Denominator DF	F-Test Value	P-Value
26	19	1.132	0.792

Conclusion with Alpha = 0.05

Two variances appear to be equal

Sample 1 Data: SITE_SO_SVOCs_EPHs|Benzo(a)Pyrene|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Benzo(a)Pyrene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	20
Number of Non-Detects	1	1
Number of Detects	26	19
Minimum Non-Detect	0.01	0.011
Maximum Non-Detect	0.01	0.011
Percent Non-detects	3.70%	5.00%
Minimum Detect	0.0038	0.0045
Maximum Detect	0.5	0.28
Mean of Detects	0.0759	0.0483
Median of Detects	0.0495	0.022
SD of Detects	0.104	0.0644
KM Mean	0.0734	0.0462
KM SD	0.101	0.0617

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	1.327
TW Critical Value (0.05)	1.645
P-Value	0.0922

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: SITE_SO_Metals|Mercury|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_Metals|Mercury|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	20
Number of Non-Detects	6	3
Number of Detects	21	17
Minimum Non-Detect	0.014	0.014
Maximum Non-Detect	0.017	0.018
Percent Non-detects	22.22%	15.00%
Minimum Detect	0.0092	0.0072
Maximum Detect	2.14	0.0542
Mean of Detects	0.127	0.0311
Median of Detects	0.025	0.03
SD of Detects	0.461	0.0106
KM Mean	0.102	0.0275
KM SD	0.4	0.0127

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	-1.487
TW Critical Value (0.05)	1.645
P-Value	0.931

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/23/2020 9:20:10 AM
From File	HypTest_Input_SS_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: SITE_SO_Metals|Cadmium|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_Metals|Cadmium|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	20
Number of Non-Detects	1	0
Number of Detect Data	26	20
Minimum Non-Detect	0.016	N/A
Maximum Non-Detect	0.016	N/A
Percent Non-detects	3.70%	0.00%
Minimum Detect	0.016	0.031
Maximum Detect	12	0.142
Mean of Detects	1.008	0.0651
Median of Detects	0.324	0.056
SD of Detects	2.317	0.0281

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	867
Standardized WMW U-Stat	4.702
Mean (U)	270
SD(U) - Adj ties	46.47
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	1.29E-06

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

Sample 1 Data: SITE_SO_Metals|Chromium|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_Metals|Chromium|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	20
Number of Non-Detects	0	0
Number of Detect Data	27	20
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	3.53	2.62
Maximum Detect	36.4	11.8
Mean of Detects	10.62	8.796
Median of Detects	8.43	9.58
SD of Detects	7.42	2.696

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	636.5
Standardized WMW U-Stat	-0.258
Mean (U)	270
SD(U) - Adj ties	46.47

Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.602

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: SITE_SO_Metals|Copper|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_Metals|Copper|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	20
Number of Non-Detects	0	0
Number of Detect Data	27	20
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	2.99	3.39
Maximum Detect	116	17.3
Mean of Detects	17.58	8.033
Median of Detects	9.4	7.455
SD of Detects	25.23	3.749

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	736
Standardized WMW U-Stat	1.883
Mean (U)	270
SD(U) - Adj ties	46.48
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.0299

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

Sample 1 Data: SITE_SO_Metals|Lead|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_Metals|Lead|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	20
Number of Non-Detects	0	0
Number of Detect Data	27	20
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	7.1	6.44
Maximum Detect	383	34.2
Mean of Detects	71.66	17.68
Median of Detects	43.1	19.8
SD of Detects	87.85	7.228

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	786.5
Standardized WMW U-Stat	2.97
Mean (U)	270
SD(U) - Adj ties	46.47
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.00149

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2

P-Value < alpha (0.05)

Sample 1 Data: SITE_SO_Metals|Nickel|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_Metals|Nickel|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	20
Number of Non-Detects	0	0
Number of Detect Data	27	20
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	2.65	2.15
Maximum Detect	67.7	10.7
Mean of Detects	8.94	6.397
Median of Detects	5.73	6.275
SD of Detects	12.27	1.968

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	607
Standardized WMW U-Stat	-0.893
Mean (U)	270
SD(U) - Adj ties	46.48
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.814

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: SITE_SO_Metals|Silver|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_Metals|Silver|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	20
Number of Non-Detects	1	0
Number of Detect Data	26	20
Minimum Non-Detect	0.031	N/A
Maximum Non-Detect	0.031	N/A
Percent Non-detects	3.70%	0.00%
Minimum Detect	0.021	0.014
Maximum Detect	11.5	0.194
Mean of Detects	0.554	0.0681
Median of Detects	0.0714	0.061
SD of Detects	2.24	0.0473

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	690
Standardized WMW U-Stat	0.896
Mean (U)	270
SD(U) - Adj ties	46.47
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.185

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: SITE_SO_Metals|Zinc|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_Metals|Zinc|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	20
Number of Non-Detects	0	0
Number of Detect Data	27	20
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	26.5	17.5
Maximum Detect	425	51.4
Mean of Detects	67.39	29.79
Median of Detects	42.5	29.65
SD of Detects	86.69	8.49

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	826
Standardized WMW U-Stat	3.819
Mean (U)	270
SD(U) - Adj ties	46.48
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	6.69E-05

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

Sample 1 Data: SITE_SO_Metals|Antimony|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_Metals|Antimony|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	20
Number of Non-Detects	0	1
Number of Detect Data	27	19
Minimum Non-Detect	N/A	0.037
Maximum Non-Detect	N/A	0.037
Percent Non-detects	0.00%	5.00%
Minimum Detect	0.028	0.019
Maximum Detect	3.14	0.14
Mean of Detects	0.285	0.0548
Median of Detects	0.098	0.0505
SD of Detects	0.61	0.025

WMW test is meant for a Single Detection Limit Case
Use of Gehan or T-W test is suggested when multiple detection limits are present
All observations <= 0.037 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	834
Standardized WMW U-Stat	3.993
Mean (U)	270
SD(U) - Adj ties	46.47
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	3.26E-05

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

t-Test Sample 1 vs Sample 2 Comparison for Uncensored Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/23/2020 9:36:32 AM
From File	HypTest_Input_SS_c.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Sample 1 Mean <= Sample 2 Mean (Form 1)
Alternative Hypothesis	Sample 1 Mean > the Sample 2 Mean

Sample 1 Data: SITE_SO_Metals|Lead|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_Metals|Lead|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	16	20
Number of Distinct Observations	15	18
Minimum	9	6.44
Maximum	37.8	34.2
Mean	20.36	17.68
Median	19.85	19.8
SD	7.544	7.228
SE of Mean	1.886	1.616

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	34	1.087	1.691	0.142
Welch-Satterthwaite (Unequal	31.6	1.081	1.694	0.144

Pooled SD 7.370
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Do Not Reject H0, Conclude Sample 1 <= Sample 2
Welch-Satterthwaite Test: Do Not Reject H0, Conclude Sample 1 <= Sample 2

Test of Equality of Variances

Variance of Sample 1	56.92
Variance of Sample 2	52.25

Numerator DF	Denominator DF	F-Test Value	P-Value
15	19	1.089	0.848

Conclusion with Alpha = 0.05
Two variances appear to be equal

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/23/2020 9:46:28 AM
From File	HypTest_Input_SS_c.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: SITE_SO_Metals|Chromium|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_Metals|Chromium|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	16	20
Number of Non-Detects	0	0
Number of Detect Data	16	20
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	2.57	2.62
Maximum Detect	13.6	11.8
Mean of Detects	5.263	8.796
Median of Detects	4.83	9.58
SD of Detects	2.519	2.696

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	196
WMW U-Stat	60
Mean (U)	160
SD(U) - Adj ties	31.41
WMW U-Stat Critical Value (0.05)	212
Standardized WMW U-Stat	-3.2
Approximate P-Value	0.999

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: SITE_SO_Metals|Zinc|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_Metals|Zinc|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	10	20
Number of Missing Observations	6	0
Number of Non-Detects	0	0
Number of Detect Data	10	20
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	15.4	17.5
Maximum Detect	92.3	51.4
Mean of Detects	41.75	29.79
Median of Detects	35.8	29.65
SD of Detects	27.4	8.49

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	177
WMW U-Stat	122

Mean (U)	100
SD(U) - Adj ties	22.73
WMW U-Stat Critical Value (0.05)	137
Standardized WMW U-Stat	0.946
Approximate P-Value	0.172

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: SITE_SO_SVOCs_EPHs|Benzo(a)anthracene|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Benzo(a)anthracene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	20
Number of Missing Observations	6	0
Number of Distinct Observations	10	20
Minimum	0.0046	0.0031
Maximum	2.1	0.26
Mean	0.272	0.0441
Median	0.034	0.0203
SD	0.652	0.0599
SE of Mean	0.206	0.0134

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	171
WMW U-Stat	116
Mean (U)	100
SD(U) - Adj ties	22.73
WMW U-Stat Critical Value (0.05)	137
Standardized WMW U-Stat	0.682
Approximate P-Value	0.248

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: SITE_SO_SVOCs_EPHs|Benzo(g,h,i)Perylene|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Benzo(g,h,i)Perylene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	20
Number of Missing Observations	6	0
Number of Distinct Observations	10	18
Minimum	0.0076	0.0036
Maximum	1.2	0.19
Mean	0.186	0.0327
Median	0.035	0.0163
SD	0.372	0.0426
SE of Mean	0.118	0.00952

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	186.5
WMW U-Stat	131.5
Mean (U)	100
SD(U) - Adj ties	22.73
WMW U-Stat Critical Value (0.05)	137
Standardized WMW U-Stat	1.365
Approximate P-Value	0.0862

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: SITE_SO_SVOCs_EPHs|Indeno(1,2,3-CD)Pyrene|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Indeno(1,2,3-CD)Pyrene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	20
Number of Missing Observations	6	0
Number of Distinct Observations	10	19
Minimum	0.0047	0.0029
Maximum	1.2	0.16
Mean	0.178	0.0273
Median	0.033	0.0148
SD	0.372	0.036
SE of Mean	0.118	0.00804

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	184.5
WMW U-Stat	129.5
Mean (U)	100
SD(U) - Adj ties	22.73
WMW U-Stat Critical Value (0.05)	137
Standardized WMW U-Stat	1.276
Approximate P-Value	0.101

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: SITE_SO_SVOCs_EPHs|Benzo(a)Pyrene|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Benzo(a)Pyrene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	10	20
Number of Missing Observations	6	0
Number of Non-Detects	0	1
Number of Detects	10	19
Minimum Non-Detect	N/A	0.011
Maximum Non-Detect	N/A	0.011
Percent Non-detects	0.00%	5.00%
Minimum Detect	0.0073	0.0045
Maximum Detect	2.1	0.28
Mean of Detects	0.302	0.0483
Median of Detects	0.044	0.022
SD of Detects	0.655	0.0644
KM Mean	0.302	0.0462
KM SD	0.655	0.0617

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	1.071
TW Critical Value (0.05)	1.645
P-Value	0.142

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Attachment D-1
Two-Sample Hypothesis Test Output
Surface Soil

Tarone-Ware Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/28/2020 3:22:22 PM
From File	HypTest_Input_SS_c.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: SITE_SO_SVOCs_EPHs|Anthracene|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Anthracene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	19
Number of Missing Observations	0	1
Number of Non-Detects	4	8
Number of Detects	23	11
Minimum Non-Detect	0.01	0.0097
Maximum Non-Detect	0.011	0.011
Percent Non-detects	14.81%	42.11%
Minimum Detect	0.0011	0.0018
Maximum Detect	0.0655	0.021
Mean of Detects	0.0108	0.00738
Median of Detects	0.005	0.0041
SD of Detects	0.0149	0.00573
KM Mean	0.00981	0.00642
KM SD	0.0137	0.00472

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	0.199
TW Critical Value (0.05)	1.645
P-Value	0.421

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Attachment D-1
Two-Sample Hypothesis Test Output
Surface Soil

Sample 1 Data: SITE_SO_SVOCs_EPHs|Dibenzo(a,h)Anthracene|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Dibenzo(a,h)Anthracene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	19
Number of Missing Observations	0	1
Number of Non-Detects	3	5
Number of Detects	24	14
Minimum Non-Detect	0.0086	0.01
Maximum Non-Detect	0.01	0.011
Percent Non-detects	11.11%	26.32%
Minimum Detect	0.0027	0.002
Maximum Detect	0.13	0.022
Mean of Detects	0.0184	0.00947
Median of Detects	0.011	0.00675
SD of Detects	0.0269	0.0072
KM Mean	0.017	0.00817
KM SD	0.0252	0.00645

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	1.725
TW Critical Value (0.05)	1.645
P-Value	0.0422

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

Attachment D-1
Two-Sample Hypothesis Test Output
Surface Soil

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/28/2020 3:36:12 PM
From File	HypTest_Input_SS_c.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: SITE_SO_SVOCs_EPHs|Total High MW PAHs|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Total High MW PAHs|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	27	19
Number of Missing Observations	0	1
Number of Distinct Observations	26	18
Minimum	0.041	0.05
Maximum	4.4	0.95
Mean	0.737	0.358
Median	0.47	0.24
SD	0.959	0.319
SE of Mean	0.185	0.0731

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	698
Standardized WMW U-Stat	1.406
Mean (U)	256.5
SD(U) - Adj ties	44.81
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.0799

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Attachment D-1
Two-Sample Hypothesis Test Output
Surface Soil

Sample 1 Data: SITE_SO_SVOCs_EPHs|Total PAHs|mg/kg(so-onproject_bluebeach)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Total PAHs|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	27	19
Number of Missing Observations	0	1
Number of Distinct Observations	24	15
Minimum	0.068	0.088
Maximum	4.7	1.1
Mean	0.862	0.44
Median	0.55	0.31
SD	1.046	0.358
SE of Mean	0.201	0.0822

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	700
Standardized WMW U-Stat	1.451
Mean (U)	256.5
SD(U) - Adj ties	44.81
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.0734

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Attachment D-1
Two-Sample Hypothesis Test Output
Surface Soil

Tarone-Ware Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/28/2020 3:45:18 PM
From File	HypTest_Input_SS_d.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: SITE_SO_SVOCs_EPHs|Anthracene|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Anthracene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	10	19
Number of Missing Observations	6	1
Number of Non-Detects	4	8
Number of Detects	6	11
Minimum Non-Detect	0.0094	0.0097
Maximum Non-Detect	0.01	0.011
Percent Non-detects	40.00%	42.11%
Minimum Detect	0.0031	0.0018
Maximum Detect	0.276	0.021
Mean of Detects	0.06	0.00738
Median of Detects	0.00865	0.0041
SD of Detects	0.108	0.00573
KM Mean	0.0378	0.00642
KM SD	0.081	0.00472

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	1.135
TW Critical Value (0.05)	1.645
P-Value	0.128

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: SITE_SO_SVOCs_EPHs|Chrysene|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Chrysene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	10	19
Number of Missing Observations	6	1
Number of Non-Detects	0	2
Number of Detects	10	17
Minimum Non-Detect	N/A	0.0097
Maximum Non-Detect	N/A	0.01
Percent Non-detects	0.00%	10.53%
Minimum Detect	0.0074	0.0058
Maximum Detect	1.5	0.099
Mean of Detects	0.224	0.0449
Median of Detects	0.0455	0.031
SD of Detects	0.465	0.0349
KM Mean	0.224	0.0411
KM SD	0.465	0.034

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	0.385
TW Critical Value (0.05)	1.645
P-Value	0.35

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Attachment D-1
Two-Sample Hypothesis Test Output
Surface Soil

Sample 1 Data: SITE_SO_SVOCs_EPHs|Dibenzo(a,h)Anthracene|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Dibenzo(a,h)Anthracene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	10	19
Number of Missing Observations	6	1
Number of Non-Detects	3	5
Number of Detects	7	14
Minimum Non-Detect	0.0094	0.01
Maximum Non-Detect	0.01	0.011
Percent Non-detects	30.00%	26.32%
Minimum Detect	0.0032	0.002
Maximum Detect	0.21	0.022
Mean of Detects	0.0539	0.00947
Median of Detects	0.018	0.00675
SD of Detects	0.0753	0.0072
KM Mean	0.0396	0.00817
KM SD	0.0623	0.00645

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	1.495
TW Critical Value (0.05)	1.645
P-Value	0.0674

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: SITE_SO_SVOCs_EPHs|Benzo(b)fluoranthene|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Benzo(b)fluoranthene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	19
Number of Missing Observations	6	1
Number of Distinct Observations	10	18
Minimum	0.0095	0.0056
Maximum	2.2	0.14
Mean	0.325	0.0507
Median	0.0635	0.033
SD	0.685	0.046
SE of Mean	0.216	0.0106

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	174.5
WMW U-Stat	119.5
Mean (U)	95
SD(U) - Adj ties	21.79
WMW U-Stat Critical Value (0.05)	131
Standardized WMW U-Stat	1.102
Approximate P-Value	0.135

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: SITE_SO_SVOCs_EPHs|Pyrene|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Pyrene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	19
Number of Missing Observations	6	1
Number of Distinct Observations	10	18
Minimum	0.0037	0.0068
Maximum	3.9	0.18
Mean	0.571	0.0643
Median	0.059	0.034
SD	1.227	0.0634
SE of Mean	0.388	0.0145

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	155.5
WMW U-Stat	100.5
Mean (U)	95
SD(U) - Adj ties	21.79
WMW U-Stat Critical Value (0.05)	131
Standardized WMW U-Stat	0.229
Approximate P-Value	0.409

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Attachment D-1
Two-Sample Hypothesis Test Output
Surface Soil

Sample 1 Data: SITE_SO_SVOCs_EPHs|Total High MW PAHs|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Total High MW PAHs|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	19
Number of Missing Observations	6	1
Number of Distinct Observations	10	18
Minimum	0.069	0.05
Maximum	18	0.95
Mean	2.576	0.358
Median	0.405	0.24
SD	5.599	0.319
SE of Mean	1.771	0.0731

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	169
WMW U-Stat	114
Mean (U)	95
SD(U) - Adj ties	21.79
WMW U-Stat Critical Value (0.05)	131
Standardized WMW U-Stat	0.849
Approximate P-Value	0.198

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: SITE_SO_SVOCs_EPHs|Total PAHs|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: SITE_SO_SVOCs_EPHs|Total PAHs|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	19
Number of Missing Observations	6	1
Number of Distinct Observations	10	15
Minimum	0.1	0.088
Maximum	19	1.1
Mean	2.792	0.44
Median	0.47	0.31
SD	5.908	0.358
SE of Mean	1.868	0.0822

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	169
WMW U-Stat	114
Mean (U)	95
SD(U) - Adj ties	21.79
WMW U-Stat Critical Value (0.05)	131
Standardized WMW U-Stat	0.85
Approximate P-Value	0.198

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/23/2020 1:15:09 PM
From File	HypTest_Input_SB_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: RA_SO_Metals|Copper|mg/kg(so-onproject_bluebeach)
Sample 2 Data: RA_SO_Metals|Copper|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	27	20
Number of Missing Observations	23	0
Number of Distinct Observations	27	19
Minimum	1.94	4.85
Maximum	871	13.7
Mean	41.38	8.351
Median	7.9	7.665
SD	165.9	2.792
SE of Mean	31.93	0.624

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	643
Standardized WMW U-Stat	-0.118
Mean (U)	270
SD(U) - Adj ties	46.48
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.547

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: RA_SO_Metals|Lead|mg/kg(so-onproject_bluebeach)
Sample 2 Data: RA_SO_Metals|Lead|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	37	20
Number of Missing Observations	13	0
Number of Distinct Observations	37	20
Minimum	1.6	5.79
Maximum	939	54
Mean	77.3	17.14
Median	18.1	13.3
SD	203.3	12.68
SE of Mean	33.43	2.836

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	1099
Standardized WMW U-Stat	0.426
Mean (U)	370
SD(U) - Adj ties	59.81
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.335

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: RA_SO_Metals|Manganese|mg/kg(so-onproject_bluebeach)
Sample 2 Data: RA_SO_Metals|Manganese|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	27	20
Number of Missing Observations	23	0
Number of Distinct Observations	26	19
Minimum	50	74.8
Maximum	252	218
Mean	101.5	143.5
Median	92.6	130
SD	46.87	40.86
SE of Mean	9.021	9.138

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	479
Standardized WMW U-Stat	-3.647
Mean (U)	270
SD(U) - Adj ties	46.47
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	1

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: RA_SO_Metals|Arsenic|mg/kg(so-onproject_bluebeach)
Sample 2 Data: RA_SO_Metals|Arsenic|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	37	20
Number of Missing Observations	13	0
Number of Distinct Observations	33	20
Minimum	0.61	1.63
Maximum	8.02	4.03
Mean	2.201	2.462
Median	1.78	2.38
SD	1.499	0.528
SE of Mean	0.246	0.118

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	932

Attachment D-1
Two-Sample Hypothesis Test Output
Subsurface Soil

Standardized WMW U-Stat	-2.366
Mean (U)	370
SD(U) - Adj ties	59.8
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.991

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Tarone-Ware Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/23/2020 1:35:33 PM
From File	HypTest_Input_SB_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: RA_SO_Metals|Antimony|mg/kg(so-onproject_bluebeach)
Sample 2 Data: RA_SO_Metals|Antimony|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	27	20
Number of Missing Observations	23	0
Number of Non-Detects	1	1
Number of Detects	26	19
Minimum Non-Detect	0.038	0.051
Maximum Non-Detect	0.038	0.051
Percent Non-detects	3.70%	5.00%
Minimum Detect	0.017	0.016
Maximum Detect	3.75	0.065
Mean of Detects	0.281	0.0413
Median of Detects	0.086	0.041
SD of Detects	0.741	0.0118
KM Mean	0.272	0.0412
KM SD	0.715	0.0114

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	2.225
TW Critical Value (0.05)	1.645
P-Value	0.013

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

Sample 1 Data: RA_SO_Metals|Cadmium|mg/kg(so-onproject_bluebeach)
Sample 2 Data: RA_SO_Metals|Cadmium|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	37	20
Number of Missing Observations	13	0
Number of Non-Detects	5	0
Number of Detects	32	20
Minimum Non-Detect	0.015	N/A
Maximum Non-Detect	0.5	N/A
Percent Non-detects	13.51%	0.00%
Minimum Detect	0.02	0.02
Maximum Detect	9.06	0.0812
Mean of Detects	1.022	0.0493
Median of Detects	0.243	0.0465
SD of Detects	1.795	0.0172
KM Mean	0.9	0.0493
KM SD	1.672	0.0172

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	4.325
TW Critical Value (0.05)	1.645
P-Value	7.64E-06

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

t-Test Sample 1 vs Sample 2 Comparison for Uncensored Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/25/2020 3:54:06 PM
From File	HypTest_Input_SB_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Sample 1 Mean <= Sample 2 Mean (Form 1)
Alternative Hypothesis	Sample 1 Mean > the Sample 2 Mean

Sample 1 Data: RA_SO_Metals|Arsenic|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: RA_SO_Metals|Arsenic|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	6	20
Number of Missing Observations	23	0
Number of Distinct Observations	6	20
Minimum	2.9	1.63
Maximum	7.6	4.03
Mean	4.467	2.462
Median	3.65	2.38
SD	1.857	0.528
SE of Mean	0.758	0.118

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	24	4.444	1.711	0
Welch-Satterthwaite (Unequal	5.2	2.613	2.015	0.023

Pooled SD 0.969
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Reject H0, Conclude Sample 1 > Sample 2
Welch-Satterthwaite Test: Reject H0, Conclude Sample 1 > Sample 2

Test of Equality of Variances

Variance of Sample 1	3.447
Variance of Sample 2	0.279

Numerator DF	Denominator DF	F-Test Value	P-Value
5	19	12.346	0

Conclusion with Alpha = 0.05
Two variances are not equal

Tarone-Ware Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/23/2020 1:43:10 PM
From File	HypTest_Input_SB_c.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: RA_SO_SVOCs_EPHs|Naphthalene|mg/kg(so-offproject_redmapleswamp)
Sample 2 Data: RA_SO_SVOCs_EPHs|Naphthalene|mg/kg(so-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	16	20
Number of Missing Observations	13	0
Number of Non-Detects	3	15
Number of Detects	13	5
Minimum Non-Detect	0.16	0.0098
Maximum Non-Detect	0.18	0.012
Percent Non-detects	18.75%	75.00%
Minimum Detect	0.13	0.0035
Maximum Detect	14.8	0.014
Mean of Detects	2.14	0.00888
Median of Detects	0.7	0.0073
SD of Detects	4.018	0.00447
KM Mean	1.763	0.00657
KM SD	3.567	0.0028

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	5.309
TW Critical Value (0.05)	1.645
P-Value	5.51E-08

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

t-Test Sample 1 vs Sample 2 Comparison for Uncensored Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/23/2020 5:17:27 PM
From File	HypTest_Input_SD_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Sample 1 Mean <= Sample 2 Mean (Form 1)
Alternative Hypothesis	Sample 1 Mean > the Sample 2 Mean

Sample 1 Data: RA_SE_Metals|Beryllium|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Beryllium|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	15	5
Number of Missing Observations	6	2
Number of Distinct Observations	15	4
Minimum	0.215	0.358
Maximum	1.65	0.594
Mean	0.737	0.508
Median	0.519	0.56
SD	0.461	0.106
SE of Mean	0.119	0.0476

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	18	1.083	1.734	0.147
Welch-Satterthwaite (Unequal	17.3	1.787	1.74	0.046

Pooled SD 0.410
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Do Not Reject H0, Conclude Sample 1 <= Sample 2
Welch-Satterthwaite Test: Reject H0, Conclude Sample 1 > Sample 2

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/23/2020 5:55:12 PM
From File	HypTest Input SD b.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: RA_SE_Metals|Aluminum|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Aluminum|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	15	5
Number of Missing Observations	6	2
Number of Distinct Observations	15	5
Minimum	2100	5050
Maximum	20700	7890
Mean	9310	6648
Median	6020	6880
SD	6594	1136
SE of Mean	1703	508.2

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	158
WMW U-Stat	38
Mean (U)	37.5
SD(U) - Adj ties	11.46
WMW U-Stat Critical Value (0.05)	56
Standardized WMW U-Stat	0
Approximate P-Value	0.5

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: RA_SE_Metals|Arsenic|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Arsenic|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	21	7
Number of Distinct Observations	21	7
Minimum	0.59	0.3
Maximum	26.4	4.7
Mean	6.127	2.401
Median	2.86	2.64
SD	6.612	1.382
SE of Mean	1.443	0.522

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	324
Standardized WMW U-Stat	1.008

Mean (U)	73.5
SD(U) - Adj ties	18.85
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.157

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: RA_SE_Metals|Barium|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Barium|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	21	7
Number of Distinct Observations	20	7
Minimum	1.5	5.9
Maximum	120	22.2
Mean	24.5	15.73
Median	15.6	16.9
SD	29.06	5.994
SE of Mean	6.342	2.266

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	308
Standardized WMW U-Stat	0.159
Mean (U)	73.5
SD(U) - Adj ties	18.85
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.437

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: RA_SE_Metals|Chromium|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Chromium|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	21	7
Number of Distinct Observations	21	7
Minimum	2.3	5.1
Maximum	44.4	10.8
Mean	12.97	8.114
Median	8.21	9.3
SD	11.28	2.465
SE of Mean	2.461	0.932

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	314
Standardized WMW U-Stat	0.478
Mean (U)	73.5
SD(U) - Adj ties	18.85
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.317

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: RA_SE_Metals|Cobalt|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Cobalt|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	15	5
Number of Missing Observations	6	2
Number of Distinct Observations	15	5
Minimum	1.01	2.08
Maximum	31	3.15
Mean	7.222	2.66
Median	4.06	2.63
SD	8.47	0.418
SE of Mean	2.187	0.187

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	167.5
WMW U-Stat	47.5
Mean (U)	37.5
SD(U) - Adj ties	11.46
WMW U-Stat Critical Value (0.05)	56
Standardized WMW U-Stat	0.83
Approximate P-Value	0.203

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: RA_SE_Metals|Iron|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Iron|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	15	5
Number of Missing Observations	6	2
Number of Distinct Observations	15	5
Minimum	4030	8370
Maximum	123000	9610
Mean	27349	9040
Median	12200	9020
SD	34491	496.5
SE of Mean	8906	222.1

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	170
WMW U-Stat	50
Mean (U)	37.5
SD(U) - Adj ties	11.46
WMW U-Stat Critical Value (0.05)	56
Standardized WMW U-Stat	1.047
Approximate P-Value	0.147

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: RA_SE_Metals|Manganese|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Manganese|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	15	5
Number of Missing Observations	6	2
Number of Distinct Observations	15	5
Minimum	43.2	75.2
Maximum	2410	127
Mean	407.3	105.6
Median	153	106
SD	667.7	20.69
SE of Mean	172.4	9.252

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	166
WMW U-Stat	46
Mean (U)	37.5
SD(U) - Adj ties	11.46
WMW U-Stat Critical Value (0.05)	56
Standardized WMW U-Stat	0.698
Approximate P-Value	0.242

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: RA_SE_Metals|Nickel|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Nickel|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	15	5
Number of Missing Observations	6	2
Number of Distinct Observations	15	5
Minimum	2.62	4.16
Maximum	33.2	7.3
Mean	11.52	6.198
Median	9.17	6.47
SD	8.854	1.247
SE of Mean	2.286	0.558

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	166
WMW U-Stat	46
Mean (U)	37.5
SD(U) - Adj ties	11.46
WMW U-Stat Critical Value (0.05)	56
Standardized WMW U-Stat	0.698
Approximate P-Value	0.242

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: RA_SE_Metals|Thallium|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Thallium|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	15	5
Number of Missing Observations	6	2
Number of Distinct Observations	15	5
Minimum	0.032	0.0751
Maximum	0.45	0.12
Mean	0.16	0.0996
Median	0.103	0.101
SD	0.117	0.0172
SE of Mean	0.0301	0.0077

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	161
WMW U-Stat	41
Mean (U)	37.5
SD(U) - Adj ties	11.46
WMW U-Stat Critical Value (0.05)	56
Standardized WMW U-Stat	0.262
Approximate P-Value	0.397

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: RA_SE_Metals|Vanadium|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Vanadium|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	15	5
Number of Missing Observations	6	2
Number of Distinct Observations	15	5
Minimum	4.45	8.9
Maximum	70.5	14.2
Mean	22.9	12.28
Median	14.7	12.9
SD	20.3	2.069
SE of Mean	5.242	0.925

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	165
WMW U-Stat	45
Mean (U)	37.5
SD(U) - Adj ties	11.46
WMW U-Stat Critical Value (0.05)	56
Standardized WMW U-Stat	0.611
Approximate P-Value	0.271

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: RA_SE_Metals|Zinc|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Zinc|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

Attachment D-1
Two-Sample Hypothesis Test Output
Sediment - Tidal Stream Area

	Sample 1	Sample 2
Number of Valid Observations	15	5
Number of Missing Observations	6	2
Number of Distinct Observations	15	5
Minimum	19	39.5
Maximum	330	60.1
Mean	117.5	47.58
Median	92.4	46.8
SD	96.88	7.651
SE of Mean	25.02	3.422

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	181
WMW U-Stat	61
Mean (U)	37.5
SD(U) - Adj ties	11.46
WMW U-Stat Critical Value (0.05)	56
Standardized WMW U-Stat	2.008
Approximate P-Value	0.0223

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2

Sample 1 Data: RA_SE_Metals|Lead|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Lead|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	21	7
Number of Distinct Observations	21	7
Minimum	4.6	11.3
Maximum	584	54.2
Mean	85.96	27.81
Median	34.4	28.2
SD	130.6	14.21
SE of Mean	28.49	5.371

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	326
Standardized WMW U-Stat	1.114
Mean (U)	73.5
SD(U) - Adj ties	18.85
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.133

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Tarone-Ware Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/23/2020 6:34:07 PM
From File	HypTest_Input_SD_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: RA_SE_Metals|Cadmium|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Cadmium|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	21	7
Number of Non-Detects	5	2
Number of Detects	16	5
Minimum Non-Detect	0.3	0.2
Maximum Non-Detect	0.6	0.4
Percent Non-detects	23.81%	28.57%
Minimum Detect	0.013	0.025
Maximum Detect	2.9	0.104
Mean of Detects	0.483	0.0586
Median of Detects	0.181	0.053
SD of Detects	0.713	0.0288
KM Mean	0.399	0.0586
KM SD	0.623	0.0258

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	2.205
TW Critical Value (0.05)	1.645
P-Value	0.0137

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

Sample 1 Data: RA_SE_Metals|Mercury|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Mercury|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	21	7
Number of Non-Detects	3	0
Number of Detects	18	7
Minimum Non-Detect	0.021	N/A
Maximum Non-Detect	0.035	N/A
Percent Non-detects	14.29%	0.00%
Minimum Detect	0.011	0.01
Maximum Detect	0.289	0.053
Mean of Detects	0.0799	0.0343
Median of Detects	0.0425	0.038
SD of Detects	0.082	0.0135
KM Mean	0.0706	0.0343
KM SD	0.0773	0.0135

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	0.18
TW Critical Value (0.05)	1.645
P-Value	0.429

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: RA_SE_Metals|Silver|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Silver|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	21	7
Number of Non-Detects	6	2
Number of Detects	15	5
Minimum Non-Detect	0.3	0.2
Maximum Non-Detect	0.6	0.4
Percent Non-detects	28.57%	28.57%
Minimum Detect	0.009	0.021
Maximum Detect	0.837	0.057
Mean of Detects	0.189	0.0449
Median of Detects	0.129	0.049
SD of Detects	0.221	0.0142
KM Mean	0.173	0.0449
KM SD	0.193	0.0127

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	1.075
TW Critical Value (0.05)	1.645
P-Value	0.141

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: RA_SE_SVOCs|Fluorene|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_SVOCs|Fluorene|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	15	6
Number of Missing Observations	6	1
Number of Non-Detects	3	1
Number of Detects	12	5
Minimum Non-Detect	0.012	0.239
Maximum Non-Detect	0.085	0.239
Percent Non-detects	20.00%	16.67%
Minimum Detect	0.0047	0.0041
Maximum Detect	0.23	0.064
Mean of Detects	0.0561	0.0422
Median of Detects	0.0425	0.054
SD of Detects	0.0643	0.0244
KM Mean	0.0479	0.0422
KM SD	0.0579	0.0219

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	-0.218
TW Critical Value (0.05)	1.645
P-Value	0.586

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: RA_SE_Metals|Selenium|mg/kg(se-offproject_redmapleswamp)
Sample 2 Data: RA_SE_Metals|Selenium|mg/kg(se-background_tidalstreamnorth)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	21	7
Number of Non-Detects	5	1
Number of Detects	16	6
Minimum Non-Detect	0.2	2.7
Maximum Non-Detect	6.8	2.7
Percent Non-detects	23.81%	14.29%
Minimum Detect	0.05	0.09
Maximum Detect	6.19	0.6
Mean of Detects	0.968	0.258
Median of Detects	0.593	0.203
SD of Detects	1.47	0.179
KM Mean	0.87	0.258
KM SD	1.304	0.163

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	0.924
TW Critical Value (0.05)	1.645
P-Value	0.178

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/23/2020 4:40:01 PM
From File	HypTest_Input_SD_c.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: RA_SE_Metals|Aluminum|mg/kg(se-offproject_beachfront)
Sample 2 Data: RA_SE_Metals|Aluminum|mg/kg(se-background_beachfront)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	10
Number of Missing Observations	20	0
Number of Distinct Observations	9	10
Minimum	1620	3460
Maximum	10600	7710
Mean	2867	5581
Median	2070	5135
SD	2730	1570
SE of Mean	863.3	496.5

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	65
WMW U-Stat	10
Mean (U)	50
SD(U) - Adj ties	13.23
WMW U-Stat Critical Value (0.05)	72
Standardized WMW U-Stat	-3.063
Approximate P-Value	0.999

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: RA_SE_Metals|Arsenic|mg/kg(se-offproject_beachfront)
Sample 2 Data: RA_SE_Metals|Arsenic|mg/kg(se-background_beachfront)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	30	10
Number of Distinct Observations	19	10
Minimum	0.93	1.3
Maximum	3.2	2.05
Mean	1.525	1.587
Median	1.3	1.495
SD	0.617	0.249
SE of Mean	0.113	0.0789

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	566
Standardized WMW U-Stat	-1.549

Attachment D-1
Two-Sample Hypothesis Test Output
Sediment - Beachfront

Mean (U)	150
SD(U) - Adj ties	31.96
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.939

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

t-Test Sample 1 vs Sample 2 Comparison for Uncensored Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/24/2020 10:13:49 AM
From File	HypTest_Input_HS_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Sample 1 Mean <= Sample 2 Mean (Form 1)
Alternative Hypothesis	Sample 1 Mean > the Sample 2 Mean

Sample 1 Data: RA_HS_Metals|Lead|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Lead|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	16	10
Number of Distinct Observations	16	10
Minimum	12.8	23
Maximum	277	50.3
Mean	92.46	35.42
Median	66.55	35.35
SD	70.48	8.399
SE of Mean	17.62	2.656

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	24	2.529	1.711	0.009
Welch-Satterthwaite (Unequal	15.7	3.201	1.746	0.003

Pooled SD 55.952
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Reject H0, Conclude Sample 1 > Sample 2
Welch-Satterthwaite Test: Reject H0, Conclude Sample 1 > Sample 2

Test of Equality of Variances

Variance of Sample 1	4967
Variance of Sample 2	70.54

Numerator DF	Denominator DF	F-Test Value	P-Value
15	9	70.406	0

Conclusion with Alpha = 0.05
Two variances are not equal

Sample 1 Data: RA_HS_Metals|Vanadium|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Vanadium|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	10
Number of Missing Observations	6	0
Number of Distinct Observations	10	10
Minimum	13.8	8.14

Maximum	53.3	20.1
Mean	34.13	14.56
Median	34.85	14.35
SD	12.04	3.418
SE of Mean	3.809	1.081

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	18	4.942	1.734	0
Welch-Satterthwaite (Unequal	10.4	4.942	1.812	0

Pooled SD 8.853
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Reject H0, Conclude Sample 1 > Sample 2
Welch-Satterthwaite Test: Reject H0, Conclude Sample 1 > Sample 2

Test of Equality of Variances

Variance of Sample 1	145.1
Variance of Sample 2	11.68

Numerator DF	Denominator DF	F-Test Value	P-Value
9	9	12.419	0.001

Conclusion with Alpha = 0.05
Two variances are not equal

Sample 1 Data: RA_HS_Metals|Zinc|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Zinc|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	10
Number of Missing Observations	6	0
Number of Distinct Observations	10	10
Minimum	24.5	17.9
Maximum	256	37.6
Mean	93.06	27.29
Median	58.5	27
SD	81.13	5.476
SE of Mean	25.66	1.732

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	18	2.558	1.734	0.01
Welch-Satterthwaite (Unequal	9.1	2.558	1.833	0.015

Pooled SD 57.499
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Reject H0, Conclude Sample 1 > Sample 2
Welch-Satterthwaite Test: Reject H0, Conclude Sample 1 > Sample 2

Test of Equality of Variances

Variance of Sample 1	6582
Variance of Sample 2	29.99

Attachment D-1
Two-Sample Hypothesis Test Output
Hydric Surface Soil

Numerator DF	Denominator DF	F-Test Value	P-Value
9	9	219.482	0

Conclusion with Alpha = 0.05
Two variances are not equal

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/24/2020 10:37:56 AM
From File	HypTest_Input_HS_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: RA_HS_Metals|Aluminum|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Aluminum|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	9
Number of Missing Observations	6	1
Number of Distinct Observations	10	9
Minimum	4800	3880
Maximum	22000	8510
Mean	9441	6422
Median	8805	6100
SD	4787	1508
SE of Mean	1514	502.6

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	124
WMW U-Stat	69
Mean (U)	45
SD(U) - Adj ties	12.25
WMW U-Stat Critical Value (0.05)	65
Standardized WMW U-Stat	1.919
Approximate P-Value	0.0275

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2

Sample 1 Data: RA_HS_Metals|Selenium|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Selenium|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	16	10
Number of Distinct Observations	15	8
Minimum	0.19	0.13
Maximum	7.1	0.33
Mean	1.912	0.235
Median	0.925	0.23
SD	1.944	0.0714
SE of Mean	0.486	0.0226

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	289
WMW U-Stat	153
Mean (U)	80
SD(U) - Adj ties	18.97
WMW U-Stat Critical Value (0.05)	111
Standardized WMW U-Stat	3.823
Approximate P-Value	6.59E-05

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2

Sample 1 Data: RA_HS_SVOCs|Benzo(k)Fluoranthene|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Benzo(k)Fluoranthene|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	9
Number of Missing Observations	6	1
Number of Distinct Observations	10	9
Minimum	0.023	0.013
Maximum	1.8	0.26
Mean	0.287	0.0779
Median	0.086	0.027
SD	0.544	0.0831
SE of Mean	0.172	0.0277

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	118
WMW U-Stat	63
Mean (U)	45
SD(U) - Adj ties	12.24
WMW U-Stat Critical Value (0.05)	65
Standardized WMW U-Stat	1.43
Approximate P-Value	0.0763

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: RA_HS_SVOCs|Benzo(a)Pyrene|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Benzo(a)Pyrene|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	9
Number of Missing Observations	6	1
Number of Distinct Observations	10	9
Minimum	0.032	0.019
Maximum	3	0.26
Mean	0.627	0.107
Median	0.26	0.047
SD	0.944	0.0968
SE of Mean	0.298	0.0323

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	123.5
WMW U-Stat	68.5
Mean (U)	45

SD(U) - Adj ties	12.25
WMW U-Stat Critical Value (0.05)	65
Standardized WMW U-Stat	1.879
Approximate P-Value	0.0301

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.19/24/2020 10:51:14 AM
From File	HypTest_Input_HS_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: RA_HS_SVOCs|Benzo(g,h,i)Perylene|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Benzo(g,h,i)Perylene|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	10	9
Number of Missing Observations	6	1
Number of Non-Detects	1	0
Number of Detect Data	9	9
Minimum Non-Detect	0.041	N/A
Maximum Non-Detect	0.041	N/A
Percent Non-detects	10.00%	0.00%
Minimum Detect	0.015	0.019
Maximum Detect	1.6	0.22
Mean of Detects	0.377	0.0892
Median of Detects	0.17	0.036
SD of Detects	0.511	0.078

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	119.5
WMW U-Stat	64.5
Mean (U)	45
SD(U) - Adj ties	12.22
WMW U-Stat Critical Value (0.05)	65
Standardized WMW U-Stat	1.595
Approximate P-Value	0.0554

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: RA_HS_SVOCs|Indeno(1,2,3-CD)Pyrene|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Indeno(1,2,3-CD)Pyrene|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	10	10
Number of Missing Observations	6	0
Number of Non-Detects	1	0
Number of Detect Data	9	10
Minimum Non-Detect	0.041	N/A
Maximum Non-Detect	0.041	N/A

Percent Non-detects	10.00%	0.00%
Minimum Detect	0.037	0.0145
Maximum Detect	3.3	0.24
Mean of Detects	0.558	0.0782
Median of Detects	0.18	0.03
SD of Detects	1.046	0.0793

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	129
WMW U-Stat	74
Mean (U)	50
SD(U) - Adj ties	13.23
WMW U-Stat Critical Value (0.05)	72
Standardized WMW U-Stat	1.835
Approximate P-Value	0.0332

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2

Sample 1 Data: RA_HS_SVOCs|Benzo(b)fluoranthene|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Benzo(b)fluoranthene|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	9
Number of Missing Observations	6	1
Number of Distinct Observations	9	9
Minimum	0.065	0.033
Maximum	4.3	0.95
Mean	0.841	0.248
Median	0.39	0.069
SD	1.302	0.301
SE of Mean	0.412	0.1

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	121
WMW U-Stat	66
Mean (U)	45
SD(U) - Adj ties	12.25
WMW U-Stat Critical Value (0.05)	65
Standardized WMW U-Stat	1.675
Approximate P-Value	0.047

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2

Sample 1 Data: RA_HS_SVOCs|Pyrene|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Pyrene|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	10
Number of Missing Observations	6	0
Number of Distinct Observations	9	10
Minimum	0.038	0.041
Maximum	6.8	1.4

Mean	1.311	0.358
Median	0.51	0.114
SD	2.118	0.436
SE of Mean	0.67	0.138

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	119.5
WMW U-Stat	64.5
Mean (U)	50
SD(U) - Adj ties	13.22
WMW U-Stat Critical Value (0.05)	72
Standardized WMW U-Stat	1.059
Approximate P-Value	0.145

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: RA_HS_SVOCs|Total High MW PAHs|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Total High MW PAHs|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	10
Number of Missing Observations	6	0
Number of Distinct Observations	10	9
Minimum	0.34	0.2
Maximum	37	6.2
Mean	6.661	1.547
Median	2.45	0.475
SD	11.31	1.907
SE of Mean	3.577	0.603

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	126.5
WMW U-Stat	71.5
Mean (U)	50
SD(U) - Adj ties	13.22
WMW U-Stat Critical Value (0.05)	72
Standardized WMW U-Stat	1.589
Approximate P-Value	0.0561

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2

Sample 1 Data: RA_HS_SVOCs|Total PAHs|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Total PAHs|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	10
Number of Missing Observations	6	0
Number of Distinct Observations	10	9
Minimum	0.48	0.26
Maximum	40	6.7
Mean	7.848	1.736
Median	3.2	0.56

SD	12.33	2.067
SE of Mean	3.9	0.654

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	131
WMW U-Stat	76
Mean (U)	50
SD(U) - Adj ties	13.22
WMW U-Stat Critical Value (0.05)	72
Standardized WMW U-Stat	1.93
Approximate P-Value	0.0268

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2

Tarone-Ware Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/24/2020 10:57:25 AM
From File	HypTest_Input_HS_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: RA_HS_SVOCs|Anthracene|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Anthracene|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	10	9
Number of Missing Observations	6	1
Number of Non-Detects	4	0
Number of Detects	6	9
Minimum Non-Detect	0.022	N/A
Maximum Non-Detect	0.071	N/A
Percent Non-detects	40.00%	0.00%
Minimum Detect	0.0043	0.0022
Maximum Detect	0.39	0.028
Mean of Detects	0.0946	0.0122
Median of Detects	0.0295	0.0064
SD of Detects	0.149	0.0106
KM Mean	0.0624	0.0122
KM SD	0.113	0.0106

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	1.644
TW Critical Value (0.05)	1.645
P-Value	0.0501

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: RA_HS_SVOCs|Benzo(a)anthracene|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Benzo(a)anthracene|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	10	9
Number of Missing Observations	6	1
Number of Non-Detects	2	0
Number of Detects	8	9
Minimum Non-Detect	0.028	N/A
Maximum Non-Detect	0.041	N/A
Percent Non-detects	20.00%	0.00%
Minimum Detect	0.067	0.016
Maximum Detect	3.6	0.23
Mean of Detects	0.735	0.0897
Median of Detects	0.22	0.038
SD of Detects	1.205	0.0821
KM Mean	0.594	0.0897
KM SD	1.047	0.0821

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	1.466
TW Critical Value (0.05)	1.645
P-Value	0.0714

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: RA_HS_SVOCs|Dibenzo(a,h)Anthracene|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Dibenzo(a,h)Anthracene|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	10	10
Number of Missing Observations	6	0
Number of Non-Detects	2	1
Number of Detects	8	9
Minimum Non-Detect	0.028	0.015
Maximum Non-Detect	0.041	0.015
Percent Non-detects	20.00%	10.00%
Minimum Detect	0.017	0.0039
Maximum Detect	0.49	0.054
Mean of Detects	0.117	0.0224
Median of Detects	0.052	0.009
SD of Detects	0.164	0.0204
KM Mean	0.0978	0.0207
KM SD	0.142	0.0189

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	2.022
TW Critical Value (0.05)	1.645
P-Value	0.0216

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

Sample 1 Data: RA_HS_Metals|Mercury|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Mercury|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	16	10
Number of Non-Detects	2	0
Number of Detects	14	10
Minimum Non-Detect	0.042	N/A
Maximum Non-Detect	0.083	N/A
Percent Non-detects	12.50%	0.00%
Minimum Detect	0.044	0.026
Maximum Detect	0.21	0.083
Mean of Detects	0.12	0.0465
Median of Detects	0.122	0.0455
SD of Detects	0.0416	0.0165
KM Mean	0.111	0.0465
KM SD	0.0443	0.0165

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	3.109
TW Critical Value (0.05)	1.645
P-Value	9.39E-04

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

Sample 1 Data: RA_HS_SVOCs|Chrysene|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Chrysene|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	10	10
Number of Missing Observations	6	0
Number of Non-Detects	2	0
Number of Detects	8	10
Minimum Non-Detect	0.028	N/A
Maximum Non-Detect	0.041	N/A
Percent Non-detects	20.00%	0.00%
Minimum Detect	0.1	0.0275
Maximum Detect	3.9	0.97
Mean of Detects	0.996	0.2
Median of Detects	0.405	0.046
SD of Detects	1.313	0.296
KM Mean	0.803	0.2
KM SD	1.165	0.296

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	1.244
TW Critical Value (0.05)	1.645
P-Value	0.107

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Sample 1 Data: RA_HS_SVOCs|Naphthalene|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_SVOCs|Naphthalene|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	10	10
Number of Missing Observations	6	0
Number of Non-Detects	3	2
Number of Detects	7	8
Minimum Non-Detect	0.028	0.014
Maximum Non-Detect	0.041	0.015
Percent Non-detects	30.00%	20.00%
Minimum Detect	0.011	0.0041
Maximum Detect	0.51	0.016
Mean of Detects	0.148	0.00831
Median of Detects	0.077	0.0063
SD of Detects	0.171	0.00493
KM Mean	0.107	0.0078

KM SD	0.146	0.00429

Sample 1 vs Sample 2 Tarone-Ware Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

TW Statistic	3.042
TW Critical Value (0.05)	1.645
P-Value	0.00118

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

t-Test Sample 1 vs Sample 2 Comparison for Uncensored Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/28/2020 7:11:11 PM
From File	HypTest_Input_HS_c.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Sample 1 Mean <= Sample 2 Mean (Form 1)
Alternative Hypothesis	Sample 1 Mean > the Sample 2 Mean

Sample 1 Data: RA_HS_Metals|Arsenic|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Arsenic|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	16	8
Number of Missing Observations	0	2
Number of Distinct Observations	16	7
Minimum	2.37	1
Maximum	16.3	2.54
Mean	8.648	1.805
Median	8.135	1.75
SD	4.338	0.459
SE of Mean	1.085	0.162

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	22	4.4	1.717	0
Welch-Satterthwaite (Unequal	15.7	6.24	1.746	0

Pooled SD 3.591
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Reject H0, Conclude Sample 1 > Sample 2
Welch-Satterthwaite Test: Reject H0, Conclude Sample 1 > Sample 2

Test of Equality of Variances

Variance of Sample 1	18.82
Variance of Sample 2	0.211

Numerator DF	Denominator DF	F-Test Value	P-Value
15	7	89.165	0

Conclusion with Alpha = 0.05
Two variances are not equal

Sample 1 Data: RA_HS_Metals|Chromium|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Chromium|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	16	9
Number of Missing Observations	0	1
Number of Distinct Observations	16	8
Minimum	8.25	5.3
Maximum	33.4	11.5

Mean	19.26	8.727
Median	19.3	8.38
SD	7.221	1.931
SE of Mean	1.805	0.644

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	23	4.255	1.714	0
Welch-Satterthwaite (Unequal	18.5	5.496	1.734	0

Pooled SD 5.941
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Reject H0, Conclude Sample 1 > Sample 2
Welch-Satterthwaite Test: Reject H0, Conclude Sample 1 > Sample 2

Test of Equality of Variances

Variance of Sample 1	52.14
Variance of Sample 2	3.727

Numerator DF	Denominator DF	F-Test Value	P-Value
15	8	13.99	0.001

Conclusion with Alpha = 0.05
Two variances are not equal

Sample 1 Data: RA_HS_Metals|Copper|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Copper|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	9
Number of Missing Observations	6	1
Number of Distinct Observations	10	9
Minimum	6.78	3.58
Maximum	44	8.45
Mean	23.93	5.899
Median	23.45	5.46
SD	10.95	1.585
SE of Mean	3.463	0.528

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	17	4.879	1.74	0
Welch-Satterthwaite (Unequal	9.4	5.146	1.833	0

Pooled SD 8.043
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Reject H0, Conclude Sample 1 > Sample 2
Welch-Satterthwaite Test: Reject H0, Conclude Sample 1 > Sample 2

Test of Equality of Variances

Variance of Sample 1	119.9
Variance of Sample 2	2.513

Numerator DF	Denominator DF	F-Test Value	P-Value

9	8	47.721	0

Conclusion with Alpha = 0.05
Two variances are not equal

Sample 1 Data: RA_HS_Metals|Iron|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Iron|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	9
Number of Missing Observations	6	1
Number of Distinct Observations	10	9
Minimum	5050	4740
Maximum	22600	11100
Mean	13616	7384
Median	13450	6950
SD	5374	1902
SE of Mean	1699	634

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	17	3.29	1.74	0.002
Welch-Satterthwaite (Unequal	11.4	3.436	1.796	0.003

Pooled SD 4122.134
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Reject H0, Conclude Sample 1 > Sample 2
Welch-Satterthwaite Test: Reject H0, Conclude Sample 1 > Sample 2

Test of Equality of Variances

Variance of Sample 1	28880493
Variance of Sample 2	3617428

Numerator DF	Denominator DF	F-Test Value	P-Value
9	8	7.984	0.008

Conclusion with Alpha = 0.05
Two variances are not equal

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/28/2020 7:13:47 PM
From File	HypTest_Input_HS_c.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: RA_HS_Metals|Cobalt|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Cobalt|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	9
Number of Missing Observations	6	1
Number of Distinct Observations	10	9
Minimum	1.54	1.34
Maximum	8.51	2.67
Mean	3.78	1.996
Median	2.735	1.91
SD	2.212	0.409
SE of Mean	0.7	0.136

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	131
WMW U-Stat	76
Mean (U)	45
SD(U) - Adj ties	12.25
WMW U-Stat Critical Value (0.05)	65
Standardized WMW U-Stat	2.49
Approximate P-Value	0.00638

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2

Sample 1 Data: RA_HS_Metals|Manganese|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Manganese|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	9
Number of Missing Observations	6	1
Number of Distinct Observations	10	9
Minimum	64.9	55.6
Maximum	205	90.5
Mean	96.91	72.79
Median	89.2	72.8
SD	40.74	10.67
SE of Mean	12.88	3.558

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	121
WMW U-Stat	66

Attachment D-1
Two-Sample Hypothesis Test Output
Hydric Surface Soil

Mean (U)	45
SD(U) - Adj ties	12.25
WMW U-Stat Critical Value (0.05)	65
Standardized WMW U-Stat	1.674
Approximate P-Value	0.0471

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2

t-Test Sample 1 vs Sample 2 Comparison for Uncensored Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/24/2020 11:04:30 AM
From File	HypTest_Input_HS_c.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Sample 1 Mean <= Sample 2 Mean (Form 1)
Alternative Hypothesis	Sample 1 Mean > the Sample 2 Mean

Sample 1 Data: RA_HS_Metals|Vanadium|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Vanadium|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	10
Number of Missing Observations	6	0
Number of Distinct Observations	10	10
Minimum	6.12	6.38
Maximum	45.9	24
Mean	26.96	12.51
Median	27.25	9.95
SD	11.3	5.842
SE of Mean	3.574	1.847

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	18	3.591	1.734	0.001
Welch-Satterthwaite (Unequal	13.5	3.591	1.771	0.002

Pooled SD 8.997
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Reject H0, Conclude Sample 1 > Sample 2
Welch-Satterthwaite Test: Reject H0, Conclude Sample 1 > Sample 2

Test of Equality of Variances

Variance of Sample 1	127.7
Variance of Sample 2	34.13

Numerator DF	Denominator DF	F-Test Value	P-Value
9	9	3.743	0.062

Conclusion with Alpha = 0.05
Two variances appear to be equal

t-Test Sample 1 vs Sample 2 Comparison for Uncensored Full Data Sets without NDs

User Selected Options	
Date/Time of Computation	ProUCL 5.19/28/2020 8:21:30 PM
From File	HypTest_Input_HS_d.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Sample 1 Mean <= Sample 2 Mean (Form 1)
Alternative Hypothesis	Sample 1 Mean > the Sample 2 Mean

Sample 1 Data: RA_HS_Metals|Cobalt|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Cobalt|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	9
Number of Missing Observations	6	1
Number of Distinct Observations	10	9
Minimum	0.296	1.45
Maximum	4.79	2.55
Mean	2.68	1.851
Median	2.69	1.71
SD	1.289	0.409
SE of Mean	0.408	0.136

Sample 1 vs Sample 2 Two-Sample t-Test

H0: Mean of Sample 1 - Mean of Sample 2 <= 0

Method	DF	t-Test Value	Critical t (0.05)	P-Value
Pooled (Equal Variance)	17	1.842	1.74	0.041
Welch-Satterthwaite (Unequal	11	1.928	1.796	0.04

Pooled SD 0.979
Conclusion with Alpha = 0.050
Student t (Pooled) Test: Reject H0, Conclude Sample 1 > Sample 2
Welch-Satterthwaite Test: Reject H0, Conclude Sample 1 > Sample 2

Test of Equality of Variances

Variance of Sample 1	1.661
Variance of Sample 2	0.168

Numerator DF	Denominator DF	F-Test Value	P-Value
9	8	9.915	0.004

Conclusion with Alpha = 0.05
Two variances are not equal

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options

Date/Time of Computation	ProUCL 5.19/28/2020 8:20:20 PM
From File	HypTest_Input_HS_d.xls
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: RA_HS_Metals|Arsenic|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Arsenic|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	16	9
Number of Missing Observations	0	1
Number of Distinct Observations	16	7
Minimum	0.64	0.66
Maximum	13.3	3.55
Mean	5.658	1.69
Median	5.1	1.3
SD	2.838	0.953
SE of Mean	0.71	0.318

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	269
WMW U-Stat	133
Mean (U)	72
SD(U) - Adj ties	17.66
WMW U-Stat Critical Value (0.05)	101
Standardized WMW U-Stat	3.426
Approximate P-Value	######

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2

Sample 1 Data: RA_HS_Metals|Iron|mg/kg(hs-offproject_redmapleswamp)
Sample 2 Data: RA_HS_Metals|Iron|mg/kg(hs-background)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Observations	10	9
Number of Missing Observations	6	1

Number of Distinct Observations	10	9
Minimum	2590	4680
Maximum	18700	10700
Mean	9201	6628
Median	8055	6120
SD	4560	1939
SE of Mean	1442	646.3

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	121
WMW U-Stat	66
Mean (U)	45
SD(U) - Adj ties	12.25
WMW U-Stat Critical Value (0.05)	65
Standardized WMW U-Stat	1.674
Approximate P-Value	0.0471

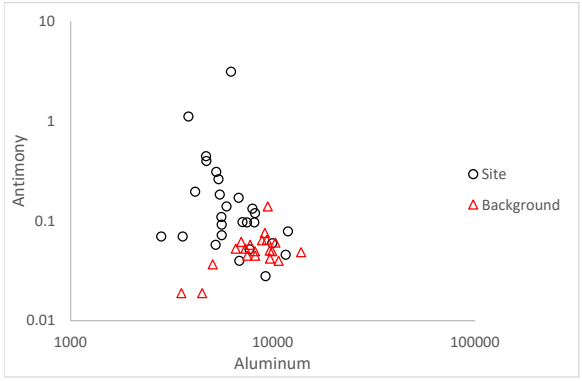
Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2

Attachment D-2

Geochemical Analysis and Graphical Comparisons

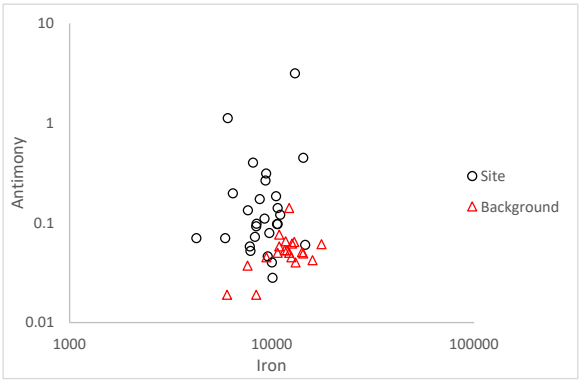
Surface Soil - On-Project Blue Beach Area - Antimony

Surface Soil, Antimony-Aluminum



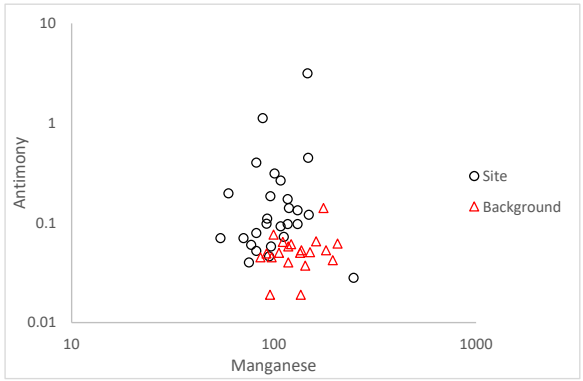
Kendalls' Tau Statistics	Kendall's tau coeff:	-0.2675
	p-value:	0.0085

Surface Soil, Antimony-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	-0.1025
	p-value:	0.3172

Surface Soil, Antimony-Manganese

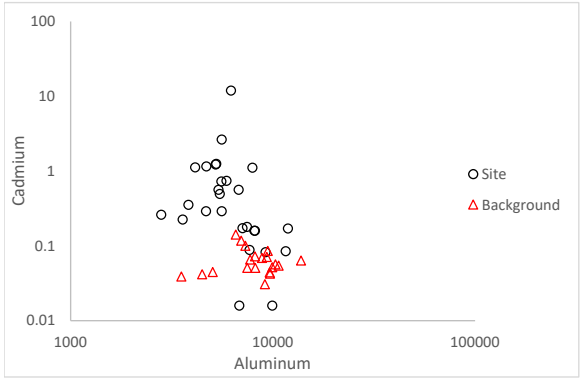


Kendalls' Tau Statistics	Kendall's tau coeff:	-0.068
	p-value:	0.5088

- The concentration trends on the regression graphs for antimony with the reference metals (aluminum, iron, and manganese) do not indicate consistent relationships and the Kendall's tau coefficients are < 0.3, indicating the relationships are extremely weak. Therefore, antimony is retained as a COPC in surface soil in the On-Project Blue Beach Area.

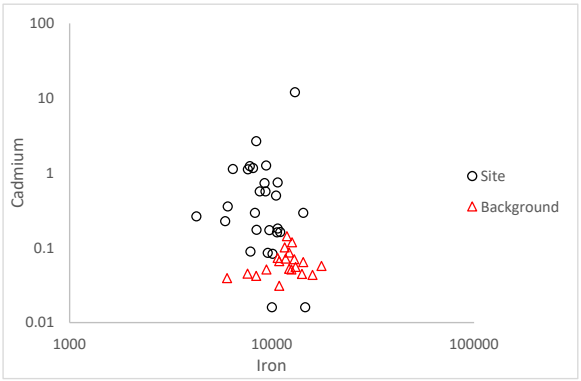
Surface Soil - On-Project Blue Beach Area - Cadmium

Surface Soil, Cadmium-Aluminum



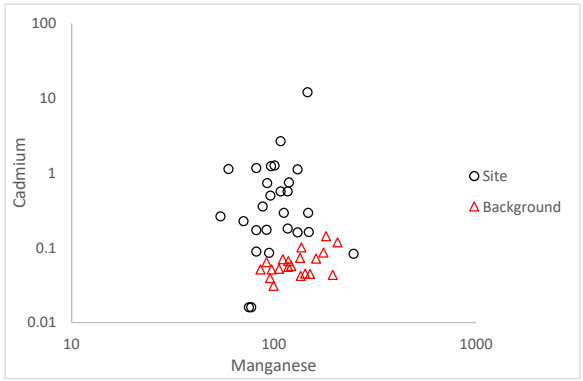
Kendalls' Tau Statistics	Kendall's tau coeff:	-0.3539
	p-value:	0.0005

Surface Soil, Cadmium-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	-0.3028
	p-value:	0.0029

Surface Soil, Cadmium-Manganese

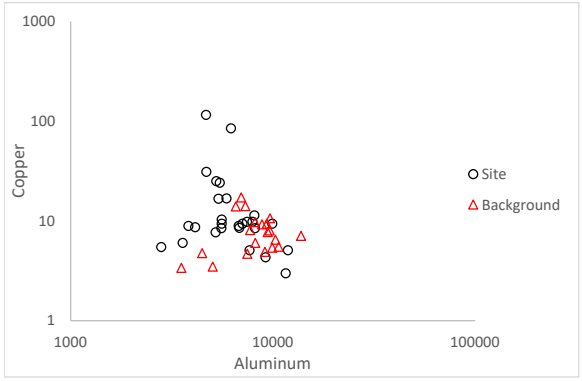


Kendalls' Tau Statistics	Kendall's tau coeff:	-0.0659
	p-value:	0.5208

- The concentration trends on the regression graphs for cadmium with the reference metals (aluminum, iron, and manganese) do not indicate consistent relationships and the Kendall's tau coefficients are < 0.3, indicating the relationships are extremely weak. Therefore, cadmium is retained as a COPC in surface soil in the On-Project Blue Beach Area.

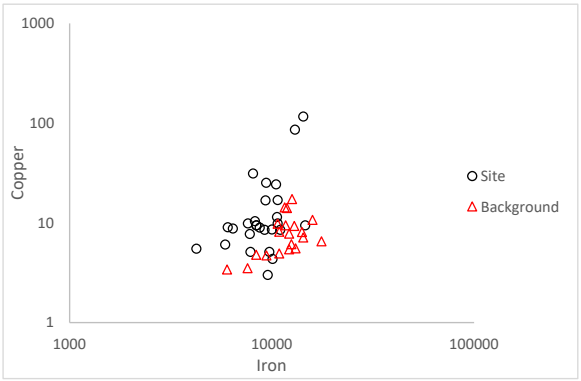
Surface Soil - On-Project Blue Beach Area - Copper

Surface Soil, Copper-Aluminum



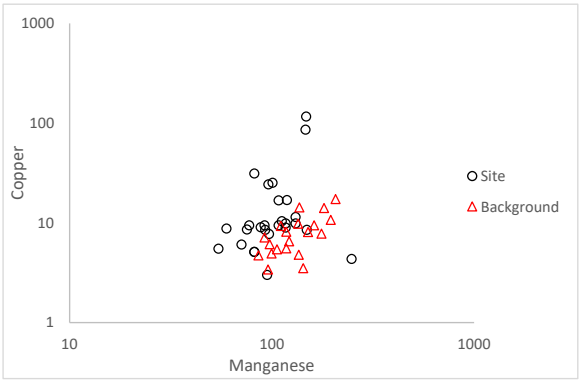
Kendalls' Tau Statistics	Kendall's tau coeff:	-0.1925
	p-value:	0.0576

Surface Soil, Copper-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.1448
	p-value:	0.1551

Surface Soil, Copper-Manganese

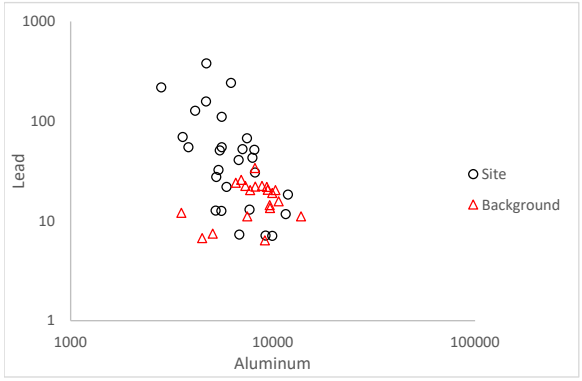


Kendalls' Tau Statistics	Kendall's tau coeff:	0.1781
	p-value:	0.0798

- The concentration trends on the regression graphs for copper with the reference metals (aluminum, iron, and manganese) do not indicate consistent relationships and the Kendall's tau coefficients are < 0.3, indicating the relationships are extremely weak. Therefore, copper is retained as a COPC in surface soil in the On-Project Blue Beach Area.

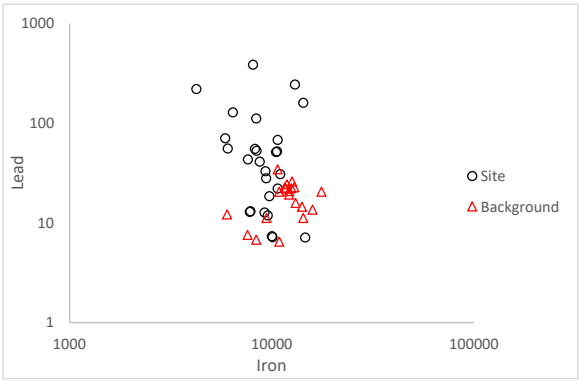
Surface Soil - On-Project Blue Beach Area - Lead

Surface Soil, Lead-Aluminum



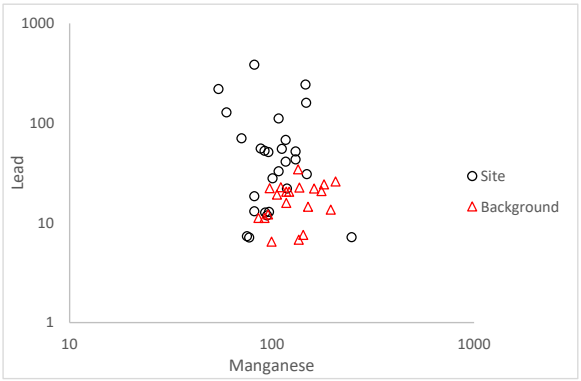
Kendalls' Tau Statistics	Kendall's tau coeff:	-0.339
	p-value:	0.0008

Surface Soil, Lead-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	-0.1839
	p-value:	0.0707

Surface Soil, Lead-Manganese

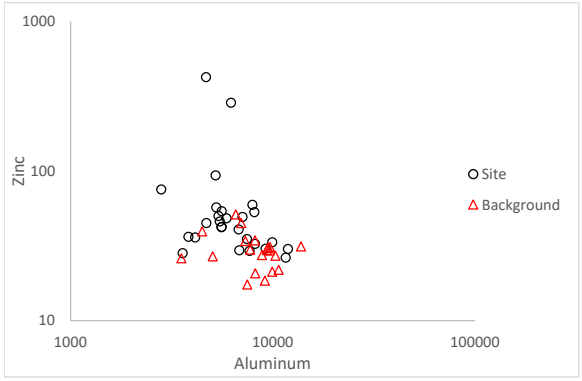


Kendalls' Tau Statistics	Kendall's tau coeff:	-0.0195
	p-value:	0.8544

- The concentration trends on the regression graphs for lead with the reference metals (aluminum, iron, and manganese) do not indicate consistent relationships and the Kendall's tau coefficients are < 0.3, indicating the relationships are extremely weak. Therefore, lead is retained as a COPC in surface soil in the On-Project Blue Beach Area.

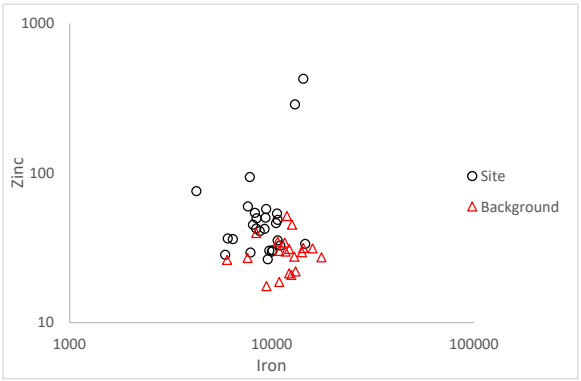
Surface Soil - On-Project Blue Beach Area - Zinc

Surface Soil, Zinc-Aluminum



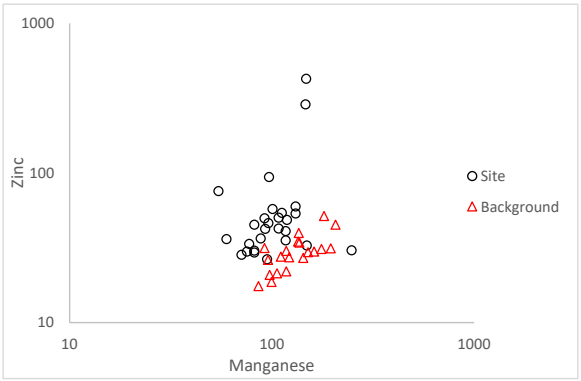
Kendalls' Tau Statistics	Kendall's tau coeff:	-0.3395
	p-value:	0.0008

Surface Soil, Zinc-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	-0.1401
	p-value:	0.1688

Surface Soil, Zinc-Manganese

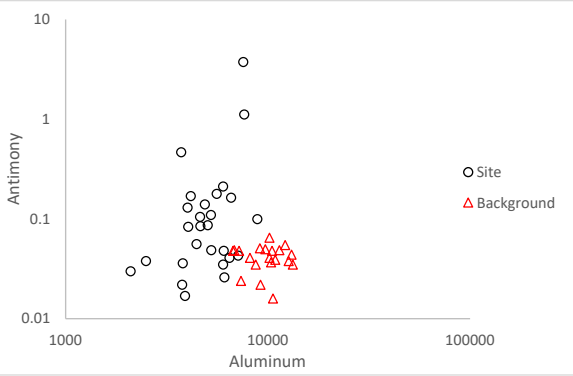


Kendalls' Tau Statistics	Kendall's tau coeff:	0.0705
	p-value:	0.4915

- The concentration trends on the regression graphs for zinc with the reference metals (aluminum, iron, and manganese) do not indicate consistent relationships and the Kendall's tau coefficients are < 0.3, indicating the relationships are extremely weak. Therefore, zinc is retained as a COPC in surface soil in the On-Project Blue Beach Area.

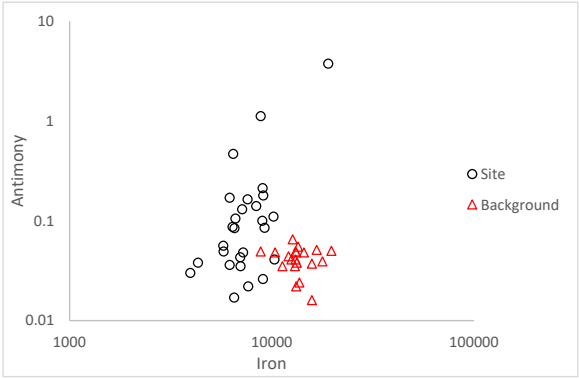
Subsurface Soil - On-Project Blue Beach Area - Antimony

Subsurface Soil, Antimony-Aluminum



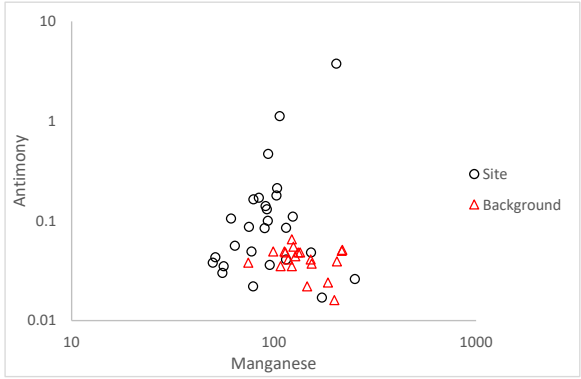
Kendalls' Tau Statistics	Kendall's tau coeff:	-0.1437
	p-value:	0.1602

Subsurface Soil, Antimony-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	-0.1158
	p-value:	0.2588

Subsurface Soil, Antimony-Manganese

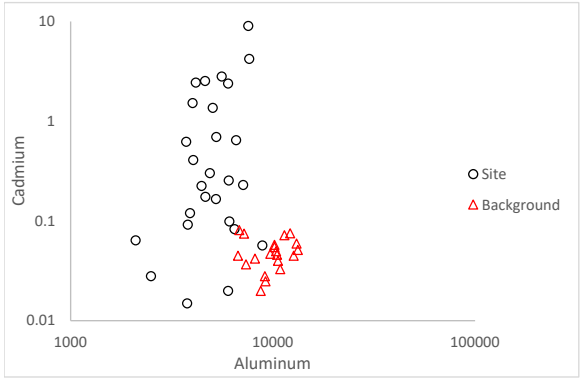


Kendalls' Tau Statistics	Kendall's tau coeff:	-0.1531
	p-value:	0.1346

- The concentration trends on the regression graphs for antimony with the reference metals (aluminum, iron, and manganese) do not indicate consistent relationships and the Kendall's tau coefficients are < 0.3, indicating the relationships are extremely weak. Therefore, antimony is retained as a COPC in subsurface soil in the On-Project Blue Beach Area.

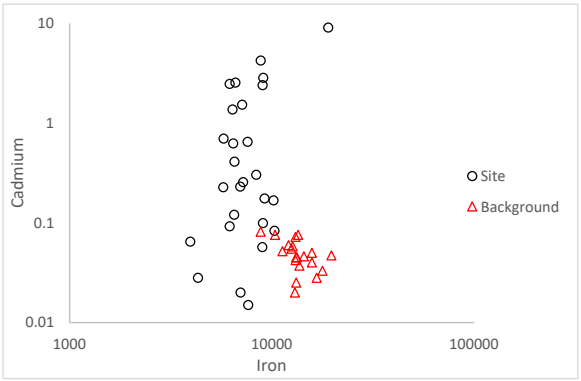
Subsurface Soil - On-Project Blue Beach Area - Cadmium

Subsurface Soil, Cadmium-Aluminum



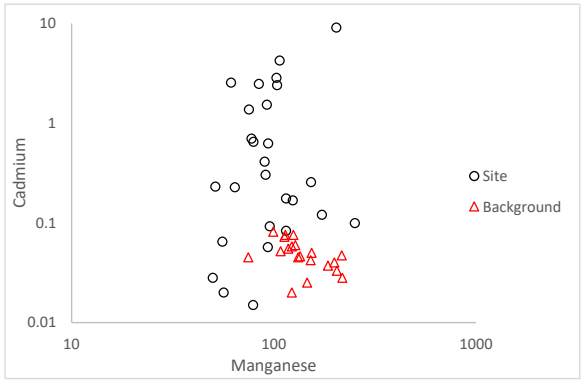
Kendalls' Tau Statistics	Kendall's tau coeff:	-0.2726
	p-value:	0.0072

Subsurface Soil, Cadmium-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	-0.3619
	p-value:	0.0004

Subsurface Soil, Cadmium-Manganese

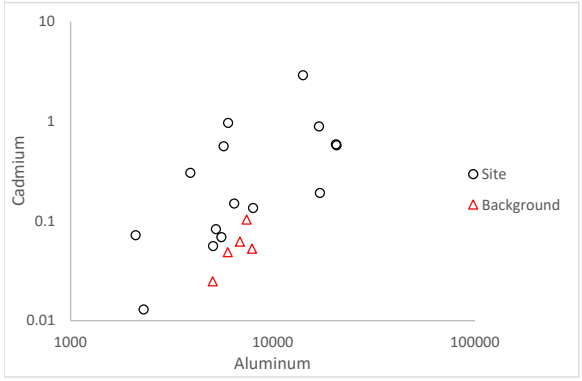


Kendalls' Tau Statistics	Kendall's tau coeff:	-0.2318
	p-value:	0.0224

- The concentration trends on the regression graphs for cadmium with the reference metals (aluminum, iron, and manganese) do not indicate consistent relationships and the Kendall's tau coefficients are < 0.3, indicating the relationships are extremely weak. Therefore, cadmium is retained as a COPC in subsurface soil in the On-Project Blue Beach Area.

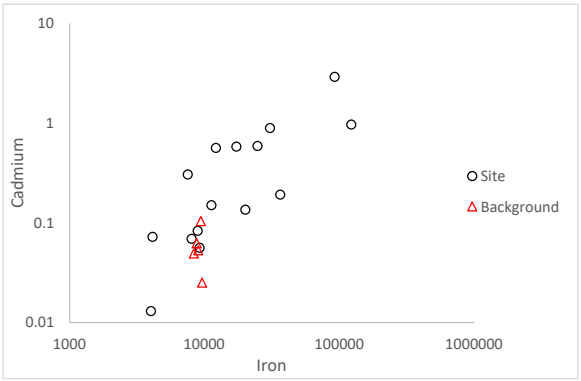
Sediment Tidal - Off-Project Red Maple Swamp / Tidal Stream Area - Cadmium

Sediment Tidal, Cadmium-Aluminum



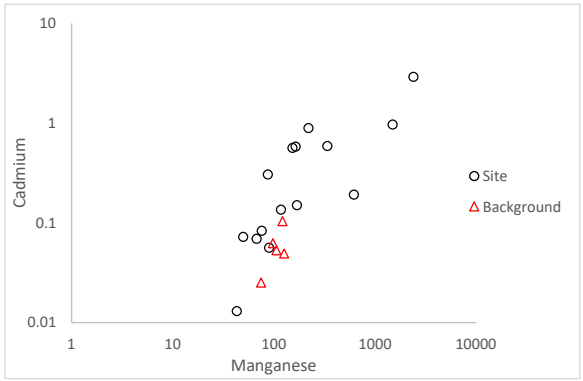
Kendalls' Tau Statistics	Kendall's tau coeff:	0.4
	p-value:	0.015

Sediment Tidal, Cadmium-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.5789
	p-value:	0.0004

Sediment Tidal, Cadmium-Manganese

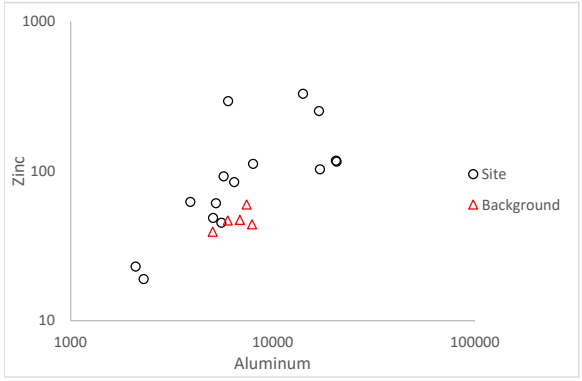


Kendalls' Tau Statistics	Kendall's tau coeff:	0.6
	p-value:	0.0002

- The concentration trend on the regression graph and Kendall's tau coefficient of 0.6 for cadmium and manganese indicate a consistent relationship between these constituents. Therefore, cadmium is eliminated as a COPC in tidal sediment in the Off-Project Red Maple Swamp / Tidal Stream Area.

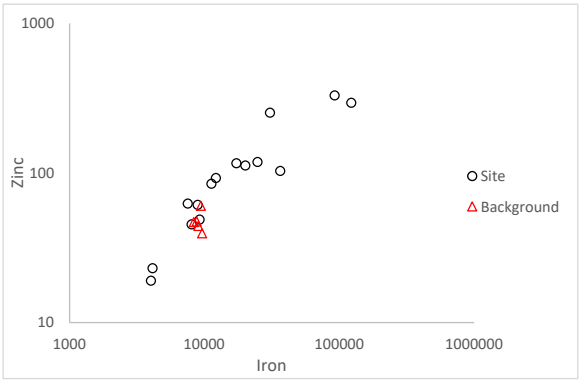
Sediment Tidal - Off-Project Red Maple Swamp / Tidal Stream Area - Zinc

Sediment Tidal, Zinc-Aluminum



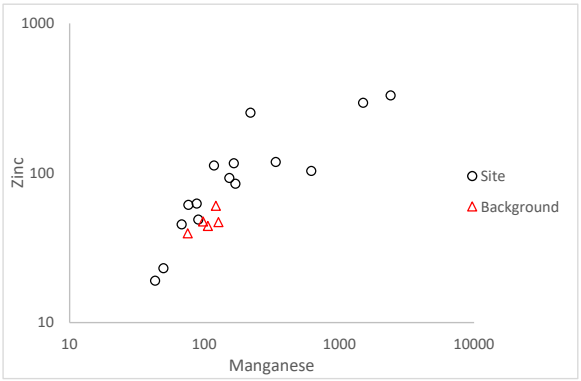
Kendalls' Tau Statistics	Kendall's tau coeff:	0.4947
	p-value:	0.0026

Sediment Tidal, Zinc-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.7158
	p-value:	0

Sediment Tidal, Zinc-Manganese

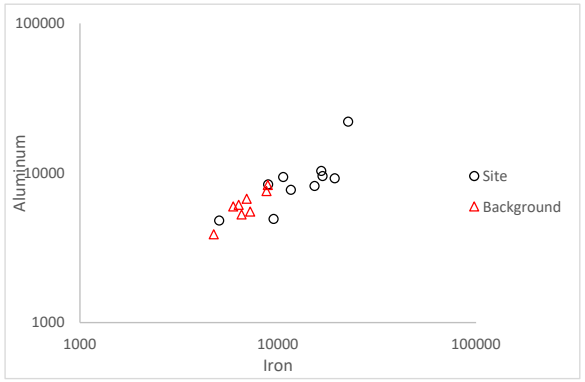


Kendalls' Tau Statistics	Kendall's tau coeff:	0.6947
	p-value:	0

- The concentration trend on the regression graph and Kendall's tau coefficient of 0.69 for zinc and manganese indicate a consistent relationship between these constituents. Therefore, zinc is eliminated as a COPC in tidal sediment in the Off-Project Red Maple Swamp / Tidal Stream Area.

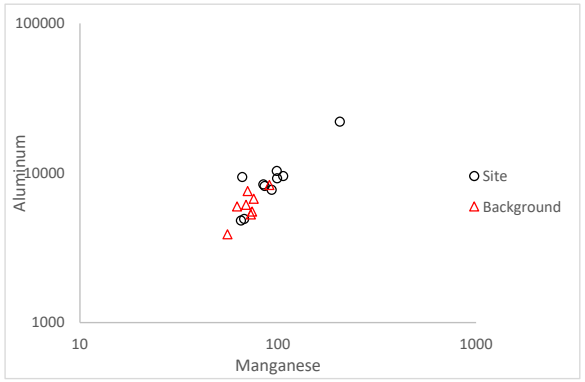
Hydric Surface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Aluminum

Hydric Surface Soil, Aluminum-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.6993
	p-value:	0.0001

Hydric Surface Soil, Aluminum-Manganese

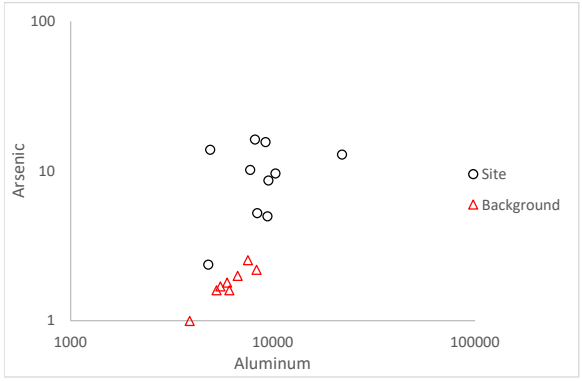


Kendalls' Tau Statistics	Kendall's tau coeff:	0.6471
	p-value:	0.0002

- The concentration trend on the regression graph and Kendall's tau coefficient of > 0.6 for aluminum and iron and aluminum and manganese indicate a consistent relationship between these constituents. Therefore, aluminum is eliminated as a COPC in hydric surface soil in the Off-Project Red Maple Swamp / Tidal Stream Area.

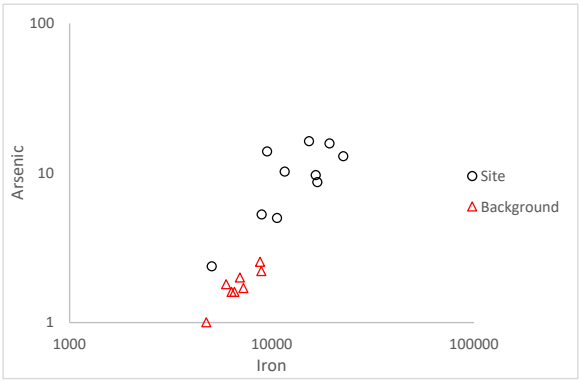
Hydric Surface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Arsenic

Hydric Surface Soil, Arsenic-Aluminum



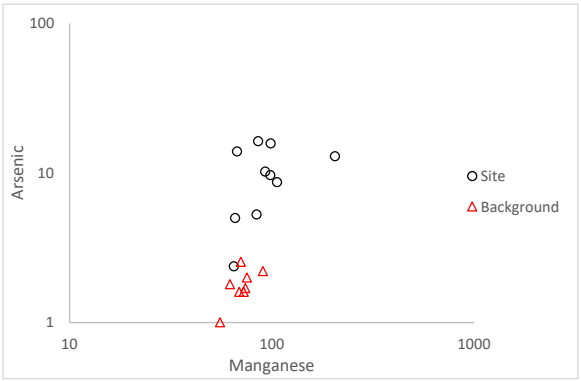
Kendalls' Tau Statistics	Kendall's tau coeff:	0.4852
	p-value:	0.0057

Hydric Surface Soil, Arsenic-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.6689
	p-value:	0.0001

Hydric Surface Soil, Arsenic-Manganese

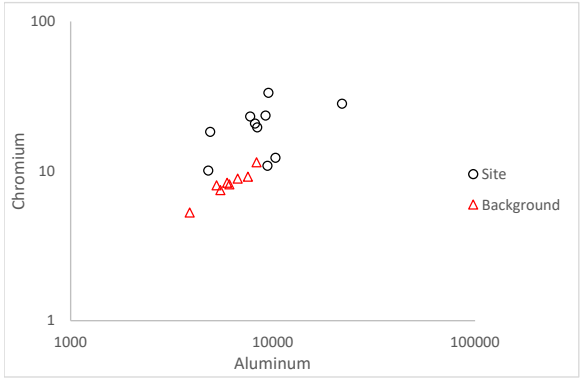


Kendalls' Tau Statistics	Kendall's tau coeff:	0.459
	p-value:	0.0089

- Although the Kendall's tau coefficient is 0.67 for arsenic and iron, the site samples lie off the trend formed by the background samples for these constituents. Therefore, arsenic is retained as a COPC in hydric surface soil in the Off-Project Red Maple Swamp / Tidal Stream Area.

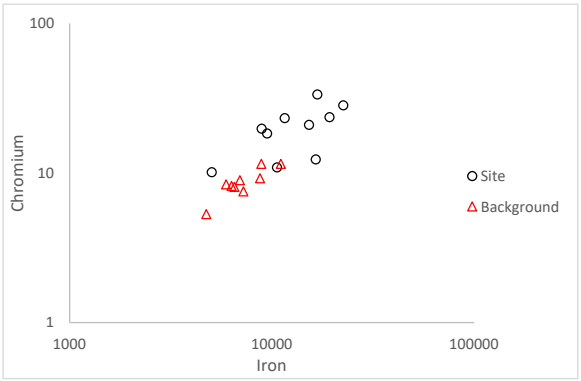
Hydric Surface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Chromium

Hydric Surface Soil, Chromium-Aluminum



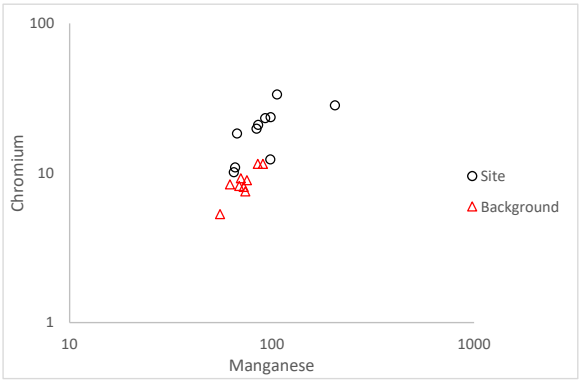
Kendalls' Tau Statistics	Kendall's tau coeff:	0.5686
	p-value:	0.0011

Hydric Surface Soil, Chromium-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.6921
	p-value:	0

Hydric Surface Soil, Chromium-Manganese

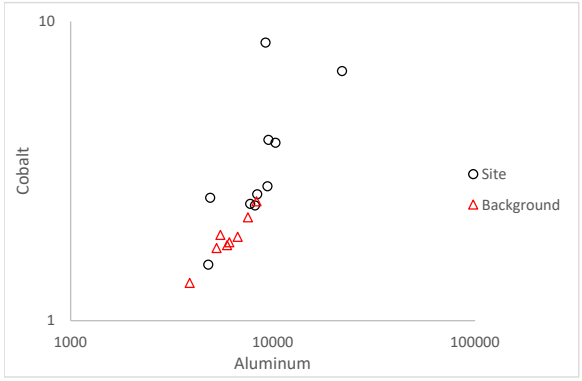


Kendalls' Tau Statistics	Kendall's tau coeff:	0.5982
	p-value:	0.0004

- The Kendall's tau coefficient is 0.69 for chromum and iron. Although many of the site samples have higher chromium than background samples, the site samples lie on the trend line for chromium and iron formed by the background samples. Therefore, chromium is eliminated as a COPC in hydric surface soil in the Off-Project Red Maple Swamp / Tidal Stream Area.

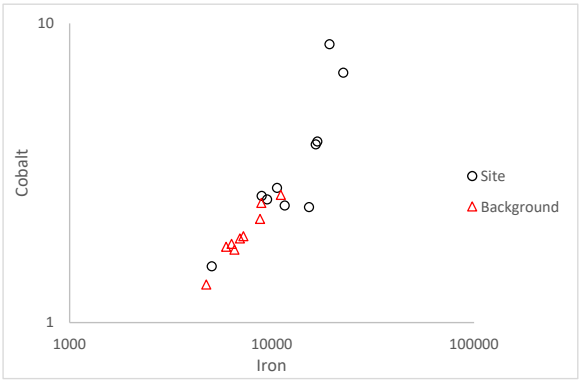
Hydric Surface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Cobalt

Hydric Surface Soil, Cobalt-Aluminum



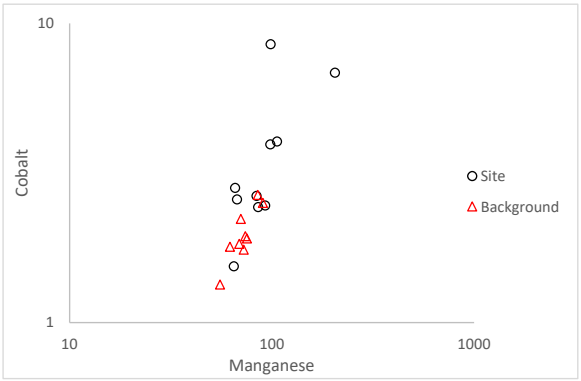
Kendalls' Tau Statistics	Kendall's tau coeff:	0.7647
	p-value:	0

Hydric Surface Soil, Cobalt-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.8129
	p-value:	0

Hydric Surface Soil, Cobalt-Manganese

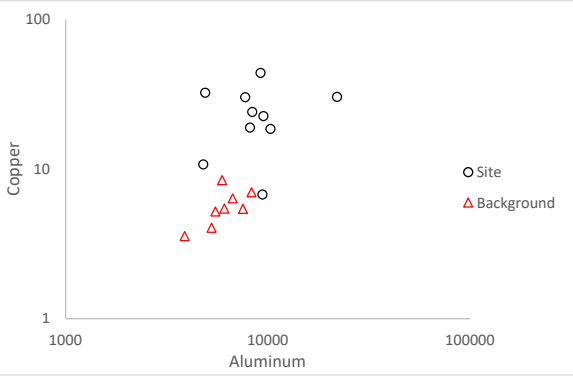


Kendalls' Tau Statistics	Kendall's tau coeff:	0.5906
	p-value:	0.0005

- The concentration trend on the regression graph and Kendall's tau coefficient of 0.81 for cobalt and iron indicate a consistent relationship between these constituents. Therefore, cobalt is eliminated as a COPC in hydric surface soil in the Off-Project Red Maple Swamp / Tidal Stream Area.

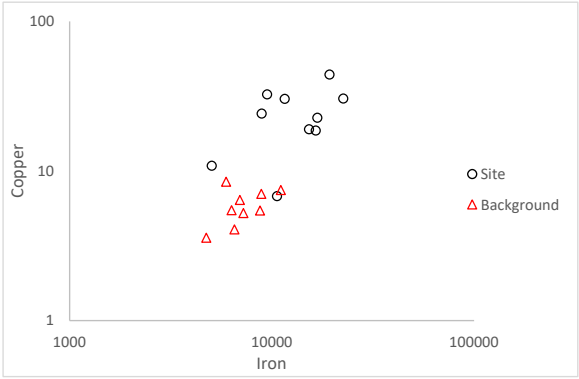
Hydric Surface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Copper

Hydric Surface Soil, Copper-Aluminum



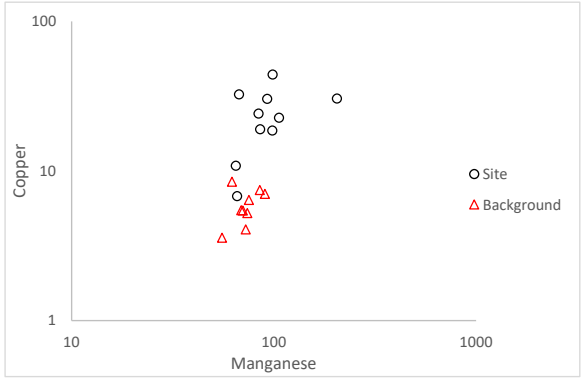
Kendalls' Tau Statistics	Kendall's tau coeff:	0.3856
	p-value:	0.028

Hydric Surface Soil, Copper-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.5322
	p-value:	0.0016

Hydric Surface Soil, Copper-Manganese

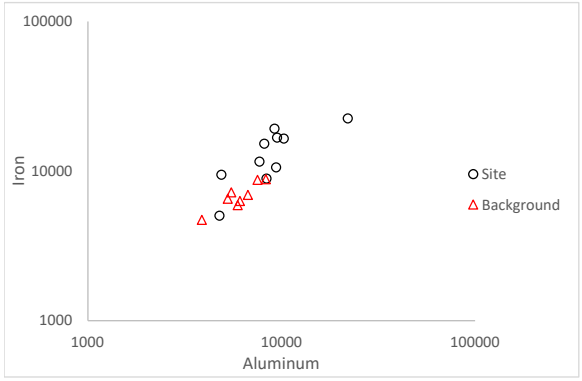


Kendalls' Tau Statistics	Kendall's tau coeff:	0.4035
	p-value:	0.0174

- Although the Kendall's tau coefficient is 0.53 for copper and iron, the site samples lie off the trend formed by the background samples for these constituents. Therefore, copper is retained as a COPC in hydric surface soil in the Off-Project Red Maple Swamp / Tidal Stream Area

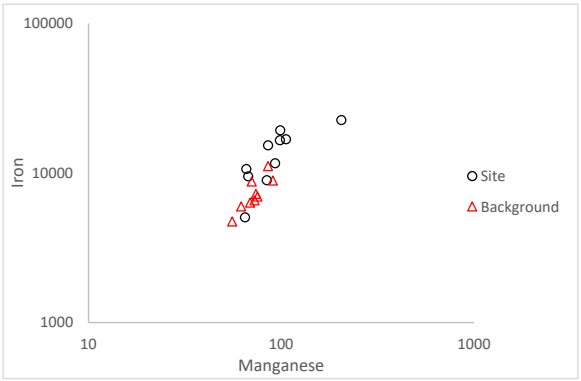
Hydric Surface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Iron

Hydric Surface Soil, Iron-Aluminum



Kendalls' Tau Statistics	Kendall's tau coeff:	0.6993
	p-value:	0.0001

Hydric Surface Soil, Iron-Manganese

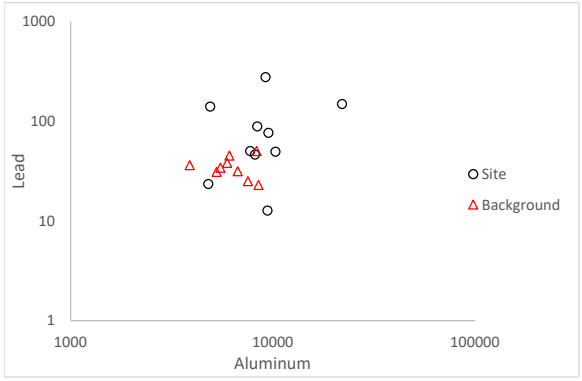


Kendalls' Tau Statistics	Kendall's tau coeff:	0.7076
	p-value:	0

- The concentration trend on the regression graph and Kendall's tau coefficient of > 0.6 for iron and aluminum and iron and manganese indicate a consistent relationship between these constituents. Therefore, iron is eliminated as a COPC in hydric surface soil in the Off-Project Red Maple Swamp / Tidal Stream Area.

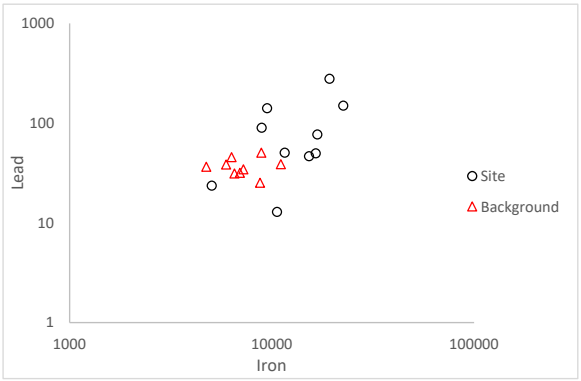
Hydric Surface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Lead

Hydric Surface Soil, Lead-Aluminum



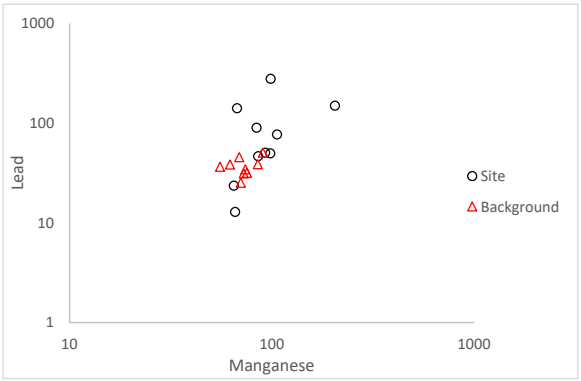
Kendalls' Tau Statistics	Kendall's tau coeff:	0.2632
	p-value:	0.1237

Hydric Surface Soil, Lead-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.4854
	p-value:	0.0041

Hydric Surface Soil, Lead-Manganese

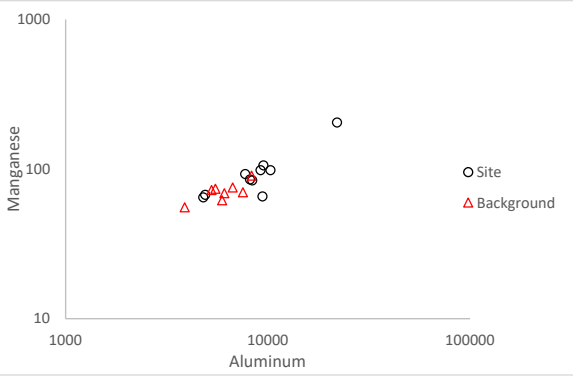


Kendalls' Tau Statistics	Kendall's tau coeff:	0.5205
	p-value:	0.0021

- Although the Kendall's tau coefficient is 0.52 for lead and manganese, background samples do not show a trend for these constituents. Therefore, lead is retained as a COPC in hydric surface soil in the Off-Project Red Maple Swamp / Tidal Stream Area

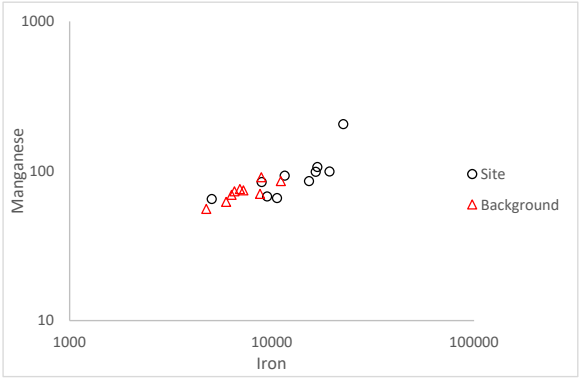
Hydric Surface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Manganese

Hydric Surface Soil, Manganese-Aluminum



Kendalls' Tau Statistics	Kendall's tau coeff:	0.6471
	p-value:	0.0002

Hydric Surface Soil, Manganese-Iron

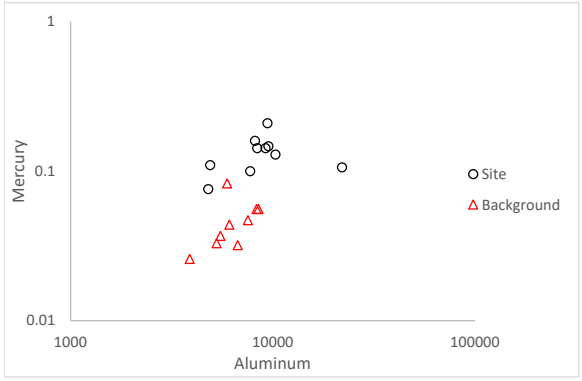


Kendalls' Tau Statistics	Kendall's tau coeff:	0.7076
	p-value:	0

- The concentration trend on the regression graph and Kendall's tau coefficient of > 0.6 for manganese and aluminum and manganese and iron indicate a consistent relationship between these constituents. Therefore, manganese is eliminated as a COPC in hydric surface soil in the Off-Project Red Maple Swamp / Tidal Stream Area.

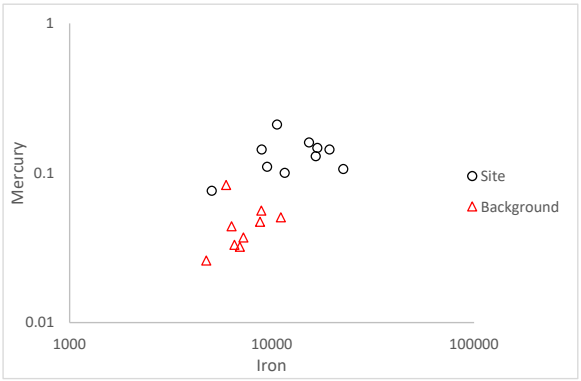
Hydric Surface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Mercury

Hydric Surface Soil, Mercury-Aluminum



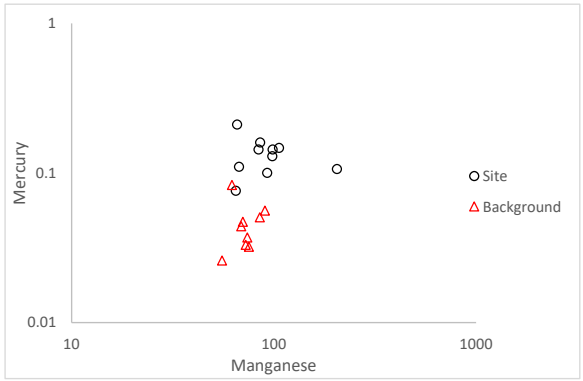
Kendalls' Tau Statistics	Kendall's tau coeff:	0.4647
	p-value:	0.0063

Hydric Surface Soil, Mercury-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.5044
	p-value:	0.0029

Hydric Surface Soil, Mercury-Manganese

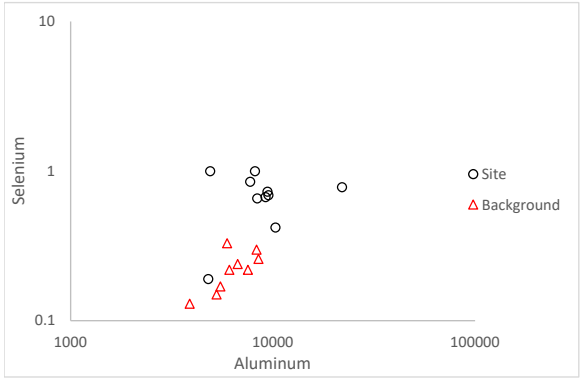


Kendalls' Tau Statistics	Kendall's tau coeff:	0.2815
	p-value:	0.0999

- Although the Kendall's tau coefficient is 0.5 for mercury and iron, the site samples lie off the trend formed by the background samples for these constituents. Therefore, mercury is retained as a COPC in hydric surface soil in the Off-Projec Red Maple Swamp / Tidal Stream Area

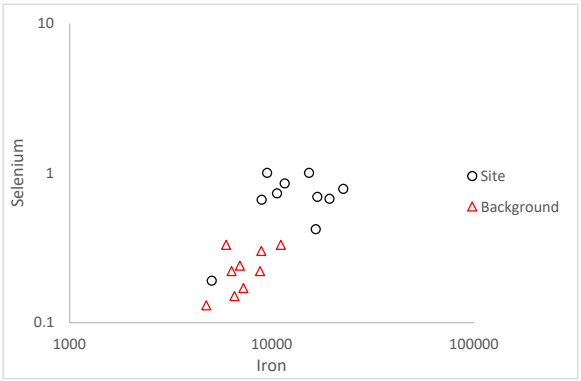
Hydric Surface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Selenium

Hydric Surface Soil, Selenium-Aluminum



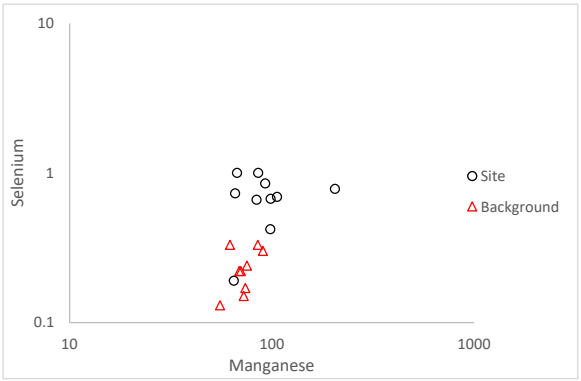
Kendalls' Tau Statistics	Kendall's tau coeff:	0.4529
	p-value:	0.0078

Hydric Surface Soil, Selenium-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.59
	p-value:	0.0005

Hydric Surface Soil, Selenium-Manganese

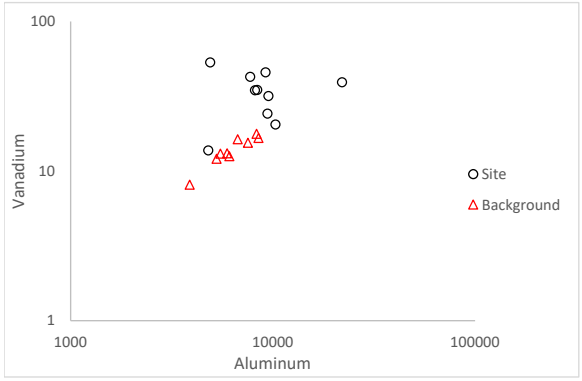


Kendalls' Tau Statistics	Kendall's tau coeff:	0.3894
	p-value:	0.0227

- Although the Kendall's tau coefficient is 0.59 for selenium and iron, the site samples lie off the trend formed by the background samples for these constituents. Therefore, selenium is retained as a COPC in hydric surface soil in the Off-Project Red Maple Swamp / Tidal Stream Area

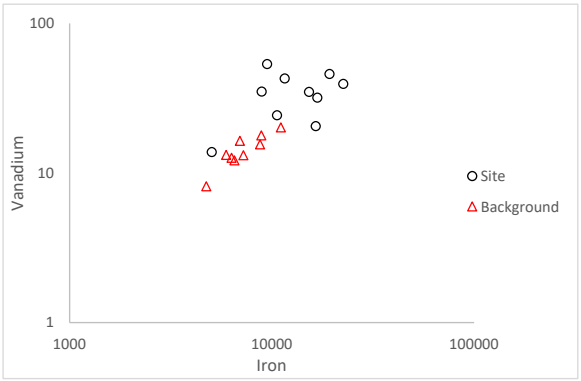
Hydric Surface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Vanadium

Hydric Surface Soil, Vanadium-Aluminum



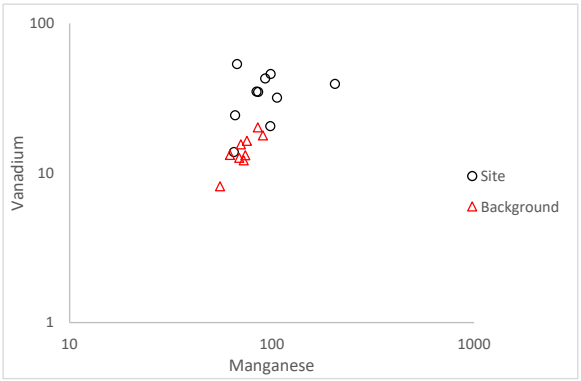
Kendalls' Tau Statistics	Kendall's tau coeff:	0.4503
	p-value:	0.0078

Hydric Surface Soil, Vanadium-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.6257
	p-value:	0.0002

Hydric Surface Soil, Vanadium-Manganese

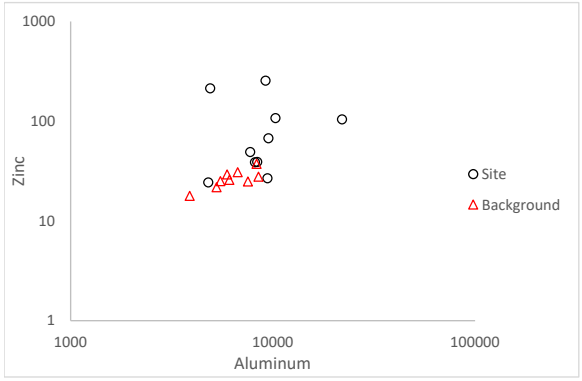


Kendalls' Tau Statistics	Kendall's tau coeff:	0.4737
	p-value:	0.0051

- The Kendall's tau coefficient is 0.63 for vanadium and iron. Although many of the site samples have higher vanadium than background samples, the site samples generally lie on the trend for vanadium and iron formed by the background samples. Therefore, vanadium is eliminated as a COPC in hydric surface soil in the Off-Project Red Maple Swamp / Tidal Stream Area.

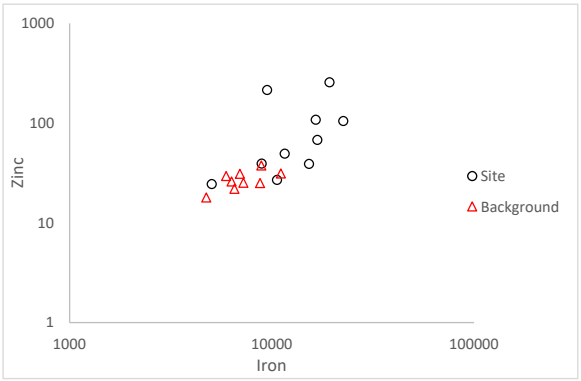
Hydric Surface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Zinc

Hydric Surface Soil, Zinc-Aluminum



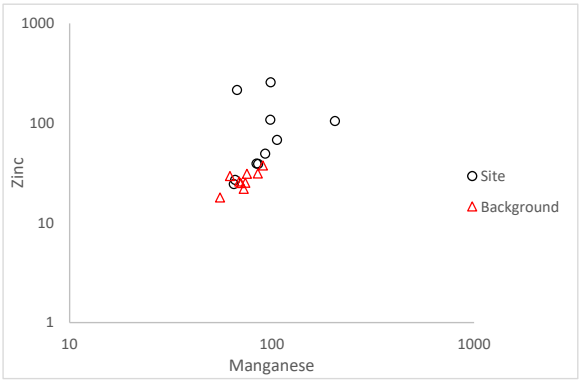
Kendalls' Tau Statistics	Kendall's tau coeff:	0.4971
	p-value:	0.0033

Hydric Surface Soil, Zinc-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.6608
	p-value:	0.0001

Hydric Surface Soil, Zinc-Manganese

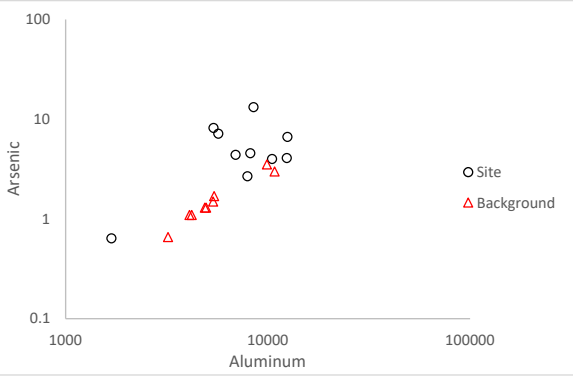


Kendalls' Tau Statistics	Kendall's tau coeff:	0.5789
	p-value:	0.0006

- The Kendall's tau coefficient is 0.66 for zinc and iron and most of the site samples lie on the trend formed by the background samples for these constituents. Therefore, zinc is eliminated as a COPC in hydric surface soil in the Off-Project Red Maple Swamp / Tidal Stream Area.

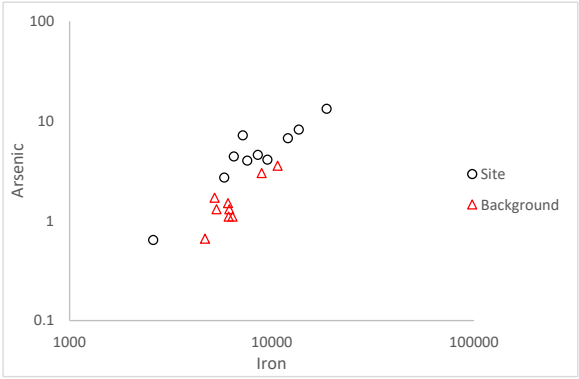
Hydric Subsurface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Arsenic

Hydric Subsurface Soil, Arsenic-Aluminum



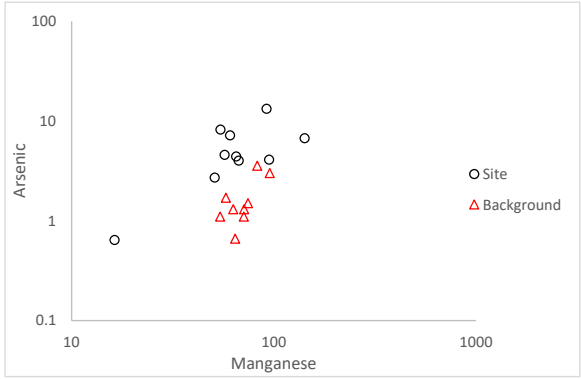
Kendalls' Tau Statistics	Kendall's tau coeff:	0.5941
	p-value:	0.0005

Hydric Subsurface Soil, Arsenic-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.6294
	p-value:	0.0002

Hydric Subsurface Soil, Arsenic-Manganese

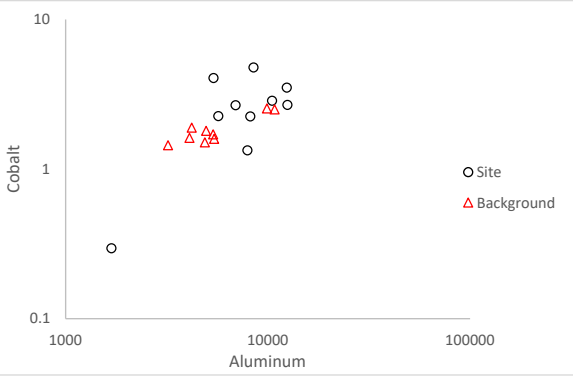


Kendalls' Tau Statistics	Kendall's tau coeff:	0.1941
	p-value:	0.2623

- The concentration trend on the regression graph and Kendall's tau coefficient of 0.63 for arsenic and iron indicate a consistent relationship between these constituents. Therefore, arsenic is eliminated as a COPC in hydric subsurface soil in the Off-Project Red Maple Swamp / Tidal Stream Area.

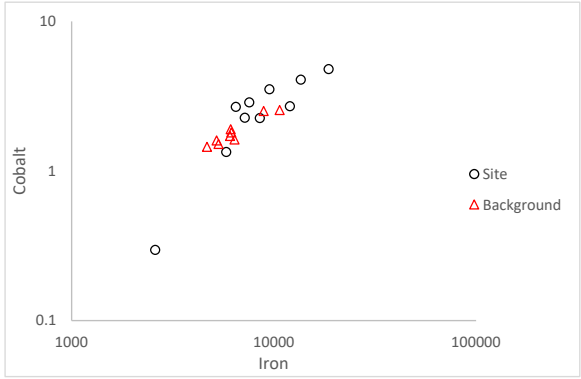
Hydric Subsurface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Cobalt

Hydric Subsurface Soil, Cobalt-Aluminum



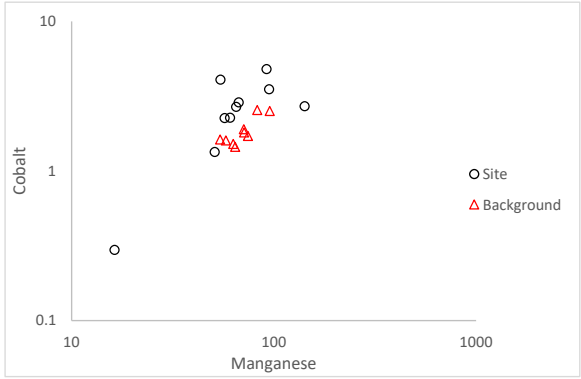
Kendalls' Tau Statistics	Kendall's tau coeff:	0.5205
	p-value:	0.0021

Hydric Subsurface Soil, Cobalt-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.7778
	p-value:	0

Hydric Subsurface Soil, Cobalt-Manganese

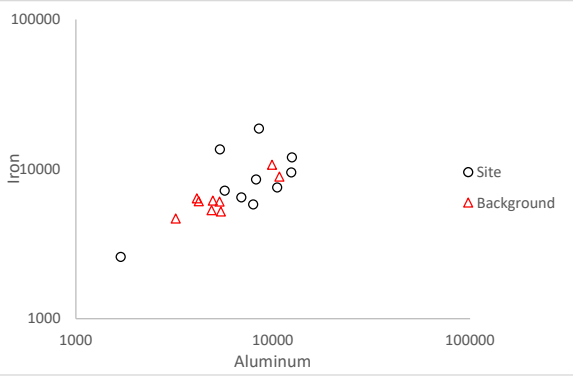


Kendalls' Tau Statistics	Kendall's tau coeff:	0.4035
	p-value:	0.0174

- The concentration trend on the regression graph and Kendall's tau coefficient of 0.78 for cobalt and iron indicate a consistent relationship between these constituents. Therefore, cobalt is eliminated as a COPC in hydric subsurface soil in the Off-Project Red Maple Swamp / Tidal Stream Area.

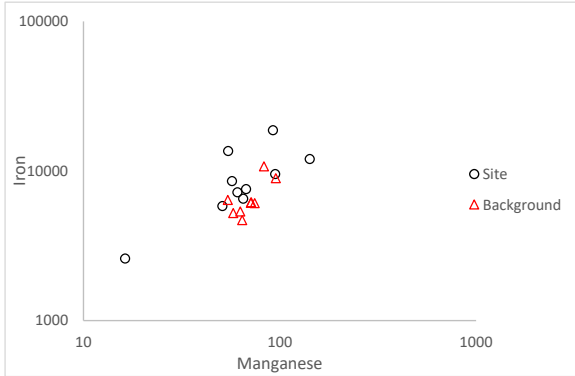
Hydric Subsurface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Iron

Hydric Subsurface Soil, Iron-Aluminum



Kendalls' Tau Statistics	Kendall's tau coeff:	0.5556
	p-value:	0.001

Hydric Subsurface Soil, Iron-Manganese

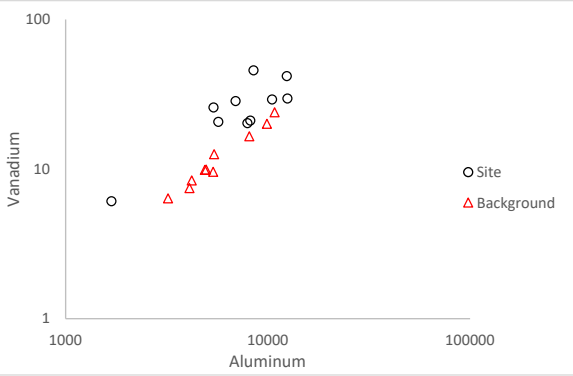


Kendalls' Tau Statistics	Kendall's tau coeff:	0.3684
	p-value:	0.0301

- The concentration trend on the regression graph and Kendall's tau coefficient 0.56 for iron and aluminum indicate a consistent relationship between these constituents. Therefore, iron is eliminated as a COPC in hydric subsurface soil in the Off-Project Red Maple Swamp / Tidal Stream Area.

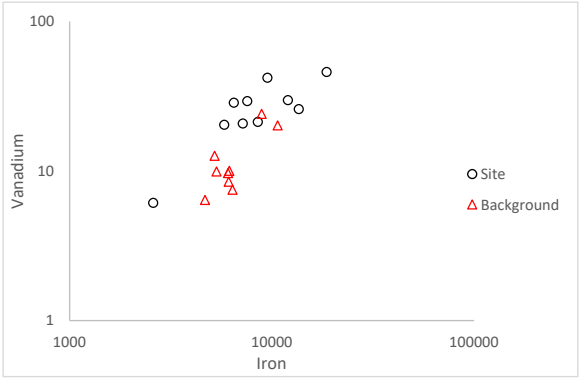
Hydric Subsurface Soil - Off-Project Red Maple Swamp / Tidal Stream Area - Vanadium

Hydric Subsurface Soil, Vanadium-Aluminum



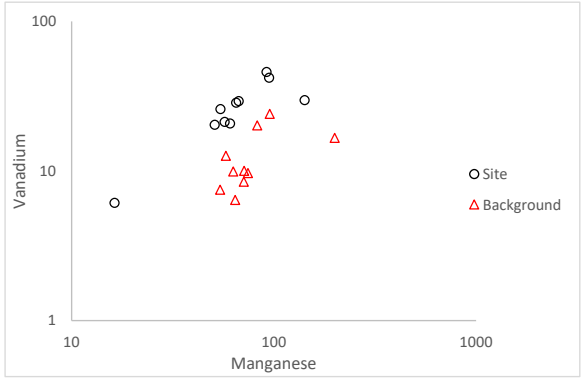
Kendalls' Tau Statistics	Kendall's tau coeff:	0.7158
	p-value:	0

Hydric Subsurface Soil, Vanadium-Iron



Kendalls' Tau Statistics	Kendall's tau coeff:	0.614
	p-value:	0.0003

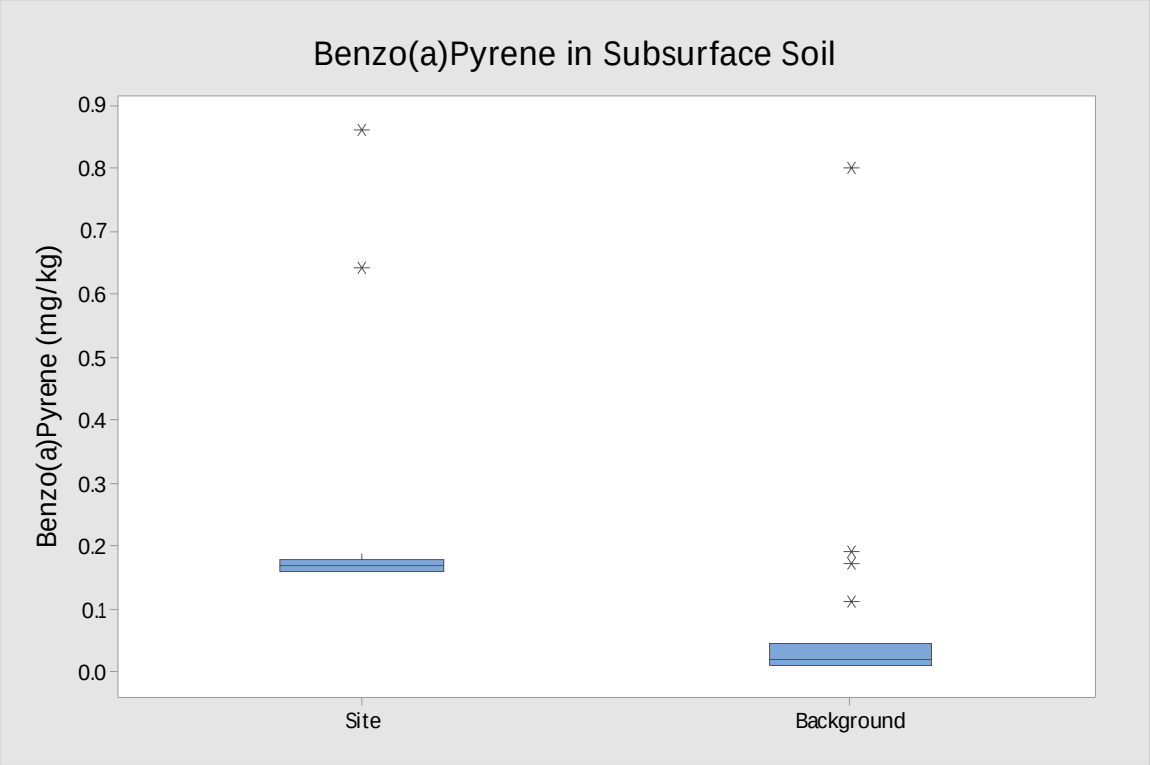
Hydric Subsurface Soil, Vanadium-Manganese

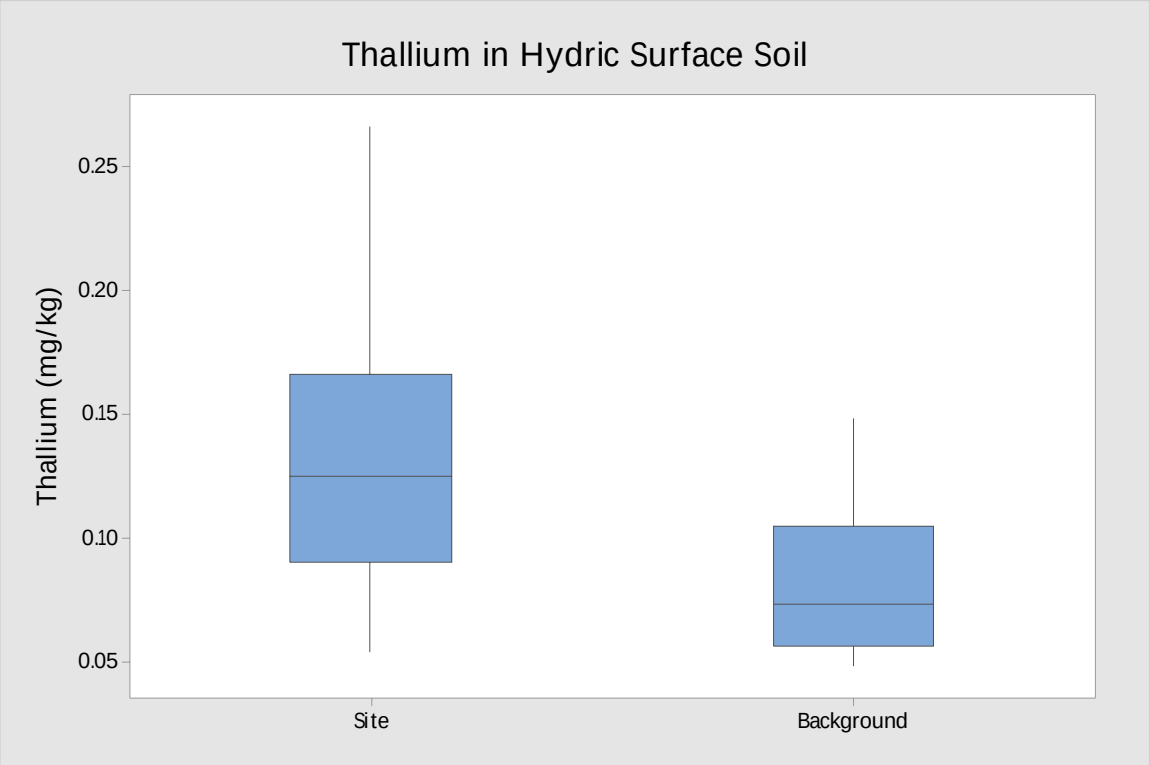


Kendalls' Tau Statistics	Kendall's tau coeff:	0.2842
	p-value:	0.0855

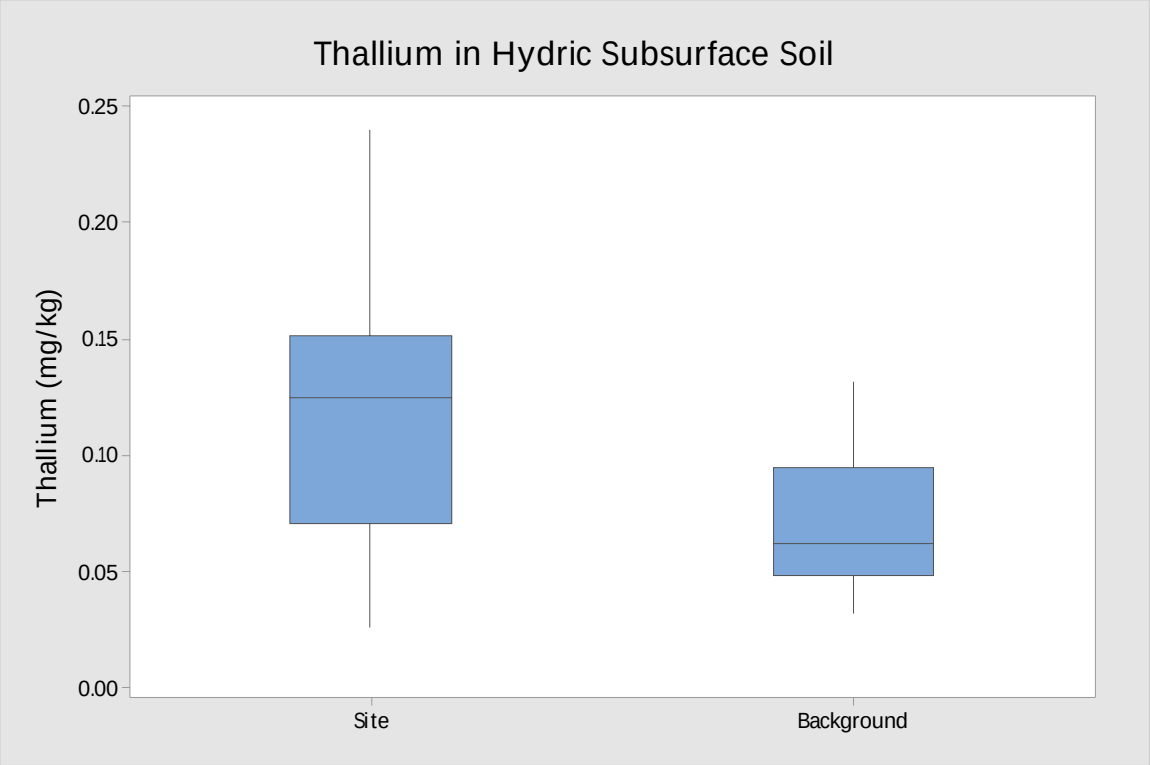
- The concentration trend on the regression graph and Kendall's tau coefficient of 0.72 for vanadium and aluminum indicate a consistent relationship between these constituents. Therefore, vanadium is eliminated as a COPC in hydric subsurface soil in the Off-Project Red Maple Swamp / Tidal Stream Area.

Attachment D-2
Graphical Comparisons





Attachment D-2
Graphical Comparisons



Attachment E

Human Health Risk Assessment Supporting Information

Attachment E-1

Dermal Absorption Parameters

ATTACHMENT E-1, TABLE E-1.1
DERMAL ABSORPTION FRACTIONS FOR COPCS IN SOIL, HYDRIC SOIL, AND SEDIMENT
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern In Soil, Hydric Soil or Sediment	CAS Number	Dermal Absorption Fraction (a)	
Inorganics			
Antimony	7440-36-0	N/A	(b)
Arsenic	7440-38-2	0.03	
Cadmium	7440-43-9	0.001	
Thallium	7440-28-0	N/A	(b)
SVOCs			
Benzo(a)Pyrene	50-32-8	0.13	
Benzo(b)fluoranthene	205-99-2	0.13	
Dibenzo(a,h)Anthracene	53-70-3	0.13	
Indeno(1,2,3-CD)Pyrene	193-39-5	0.13	
PCBs			
Total PCB Aroclors	Tot-PCB-ARO	0.14	
VOCs			
1,2,4-Trimethylbenzene	95-63-6	N/A	(b)
Ethylbenzene	100-41-4	N/A	(b)
Naphthalene	91-20-3	0.13	
Total Xylenes	Tot-Xylenes	N/A	(b)
Trichloroethylene	79-01-6	N/A	(b)

Notes:

CAS = Chemical Abstracts Service.

N/A = Not available.

PCBs = Polychlorinated biphenyls.

SVOCs = Semi-volatile organic compounds.

USEPA = United States Environmental Protection Agency.

VOCs = Volatile organic compounds.

(a) USEPA, 2004. Risk Assessment Guidance for Superfund. Vol. 1, Part E. July, 2004. Exhibit 3-4.

(b) Per USEPA, 2004, VOCs are considered to volatilize from the soil/sediment on the skin; therefore, dermal absorption is considered insignificant. For the associated inorganics, sufficient data are not available to extrapolate a reasonable default value.

ATTACHMENT E-1, TABLE E-1.2
DERMAL WATER PARAMETERS FOR COPCS IN GROUNDWATER AND SURFACE WATER
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern in Groundwater and Surface Water	CAS Number	Chemical Properties			Dermal Water Parameters													
		MW g/mol	log Kow unitless		Kp (cm/hr)		B unitless		Lag Time t hr/event		t* hr		FA unitless		lsc (e) cm	log (Dsc/lsc) (d) unitless	Dsc/lsc (d) unitless	Dsc (d) unitless	b (a) unitless	c (a) unitless	In Effective Predictive Domain?
Inorganics																					
Antimony	7440-36-0	--	--		1.0E-03	(b,c)	--		--		--		--		--	--	--	--	--	--	Yes (f)
Arsenic	7440-38-2	--	--		1.0E-03	(b,c)	--		--		--		--		--	--	--	--	--	--	Yes (f)
Barium	7440-39-3	--	--		1.0E-03	(b,c)	--		--		--		--		--	--	--	--	--	--	Yes (f)
Cadmium	7440-43-9	--	--		1.0E-03	(b)	--		--		--		--		--	--	--	--	--	--	Yes (f)
Chromium	7440-47-3	--	--		1.0E-03	(b,j)	--		--		--		--		--	--	--	--	--	--	Yes (f)
Cobalt	7440-48-4	--	--		4.0E-04	(b)	--		--		--		--		--	--	--	--	--	--	Yes (f)
Iron	7439-89-6	--	--		1.0E-03	(b,c)	--		--		--		--		--	--	--	--	--	--	Yes (f)
Lead	7439-92-1	--	--	(h)	--		--		--		--		--		--	--	--	--	--	--	--
Manganese	7439-96-5	--	--		1.0E-03	(b,c)	--		--		--		--		--	--	--	--	--	--	Yes (f)
SVOCs																					
1-Methylnaphthalene	90-12-0	1.42E+02	3.87E+00	(f,i)	9.31E-02	(a)	4.27E-01	(a)	6.68E-01	(a)	1.60E+00	(a)	1.00E+00	(k)	1.00E-03	-3.60E+00	2.49E-04	2.49E-07	6.36E-01	6.61E-01	Yes (f)
2-Methylnaphthalene	91-57-6	1.42E+02	3.86E+00	(f,i)	9.17E-02	(a)	4.20E-01	(a)	6.68E-01	(a)	1.60E+00	(a)	1.00E+00	(k)	1.00E-03	-3.60E+00	2.49E-04	2.49E-07	6.29E-01	6.55E-01	Yes (f)
Benzo(a)anthracene	56-55-3	--	--		--	(f,g)	--		--		--		--		--	--	--	--	--	--	No (f,g)
Benzo(a)Pyrene	50-32-8	--	--		--	(f,g)	--		--		--		--		--	--	--	--	--	--	No (f,g)
Benzo(b)fluoranthene	205-99-2	--	--		--	(f,g)	--		--		--		--		--	--	--	--	--	--	No (f,g)
Naphthalene	91-20-3	1.28E+02	3.30E+00	(f)	4.66E-02	(a)	2.03E-01	(a)	5.58E-01	(a)	1.34E+00	(a)	1.00E+00		1.00E-03	-3.52E+00	2.99E-04	2.99E-07	4.41E-01	4.80E-01	Yes (f)
VOCs																					
1,1,2,2-Tetrachloroethane	79-34-5	1.68E+02	2.39E+00	(f)	6.9E-03	(a)	3.5E-02	(a)	9.3E-01	(a)	2.24E+00	(a)	1.00E+00		1.0E-03	-3.7E+00	1.8E-04	1.8E-07	3.2E-01	3.6E-01	Yes (f)
1,1,2-Trichloroethane	79-00-5	1.33E+02	2.05E+00	(f)	6.4E-03	(a)	2.9E-02	(a)	6.0E-01	(a)	1.43E+00	(a)	1.00E+00		1.0E-03	-3.6E+00	2.8E-04	2.8E-07	3.2E-01	3.5E-01	Yes (f)
1,1-Dichloroethane	75-34-3	9.90E+01	1.79E+00	(f)	6.7E-03	(a)	2.6E-02	(a)	3.8E-01	(a)	9.18E-01	(a)	1.00E+00		1.0E-03	-3.4E+00	4.4E-04	4.4E-07	3.2E-01	3.5E-01	Yes (f)
1,2,3-Trichlorobenzene	87-61-6	1.81E+02	4.05E+00	(i)	7.4E-02	(a)	3.8E-01	(a)	1.1E+00	(a)	2.66E+00	(a)	1.00E+00	(l)	1.0E-03	-3.8E+00	1.5E-04	1.5E-07	5.9E-01	6.2E-01	Yes (f)
1,2,4-Trimethylbenzene	95-63-6	1.20E+02	3.63E+00	(i)	8.6E-02	(a)	3.6E-01	(a)	5.0E-01	(a)	1.21E+00	(a)	1.00E+00	(l)	1.0E-03	-3.5E+00	3.3E-04	3.3E-07	5.7E-01	6.1E-01	Yes (f)
1,2-Dichloropropane	78-87-5	1.13E+02	2.00E+00	(f)	7.8E-03	(a)	3.2E-02	(a)	4.6E-01	(a)	1.10E+00	(a)	1.00E+00		1.0E-03	-3.4E+00	3.6E-04	3.6E-07	3.2E-01	3.5E-01	Yes (f)
Chloroform	67-66-3	1.19E+02	1.97E+00	(f)	6.8E-03	(a)	2.9E-02	(a)	5.0E-01	(a)	1.19E+00	(a)	1.00E+00		1.0E-03	-3.5E+00	3.3E-04	3.3E-07	3.2E-01	3.5E-01	Yes (f)
cis-1,2-Dichloroethene	156-59-2	9.69E+01	1.86E+00	(i)	1.1E-02	(i)	4.2E-02	(a)	3.7E-01	(a)	8.94E-01	(a)	1.00E+00	(m)	1.0E-03	-3.3E+00	4.5E-04	4.5E-07	3.3E-01	3.6E-01	Yes (f)
Ethylbenzene	100-41-4	1.06E+02	3.15E+00	(f)	4.9E-02	(a)	2.0E-01	(a)	4.2E-01	(a)	1.01E+00	(a)	1.00E+00		1.0E-03	-3.4E+00	4.0E-04	4.0E-07	4.4E-01	4.7E-01	Yes (f)
Naphthalene	91-20-3	1.28E+02	3.30E+00	(f)	4.7E-02	(a)	2.0E-01	(a)	5.6E-01	(a)	1.34E+00	(a)	1.00E+00		1.0E-03	-3.5E+00	3.0E-04	3.0E-07	4.4E-01	4.8E-01	Yes (f)
Tetrachloroethene	127-18-4	1.66E+02	3.40E+00	(f)	3.3E-02	(a)	1.7E-01	(a)	9.1E-01	(a)	2.18E+00	(a)	1.00E+00		1.0E-03	-3.7E+00	1.8E-04	1.8E-07	4.1E-01	4.5E-01	Yes (f)
Total Xylenes	Tot-Xylenes	1.06E+02	3.16E+00	(i)	5.0E-02	(a)	2.0E-01	(a)	4.2E-01	(a)	1.01E+00	(a)	1.00E+00		1.0E-03	-3.4E+00	4.0E-04	4.0E-07	4.4E-01	4.8E-01	Yes (f)
Trichloroethylene	79-01-6	1.31E+02	2.42E+00	(f)	1.2E-02	(a)	5.1E-02	(a)	5.8E-01	(a)	1.39E+00	(a)	1.00E+00		1.0E-03	-3.5E+00	2.9E-04	2.9E-07	3.4E-01	3.7E-01	Yes (f)
Vinyl Chloride	75-01-4	6.25E+01	1.36E+00	(f)	5.6E-03	(a)	1.7E-02	(a)	2.4E-01	(a)	5.73E-01	(a)	1.00E+00		1.0E-03	-3.2E+00	7.0E-04	7.0E-07	3.1E-01	3.4E-01	Yes (f)

ATTACHMENT E-1, TABLE E-1.2
DERMAL WATER PARAMETERS FOR COPCS IN GROUNDWATER AND SURFACE WATER
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical of Potential Concern in Groundwater and Surface Water	CAS Number	Chemical Properties		Dermal Water Parameters											
		MW g/mol	log Kow unitless	Kp (cm/hr)	B unitless	Lag Time t hr/event	t* hr	FA unitless	lsc (e) cm	log (Dsc/lsc) (d) unitless	Dsc/lsc (d) unitless	Dsc (d) unitless	b (a) unitless	c (a) unitless	In Effective Predictive Domain?

Notes:

-- = Not Applicable/Not Available.

CAS = Chemical Abstracts Service.

SVOCs = semivolatile organic compounds.

USEPA, 2004 = United States Environmental Protection Agency (USEPA) Risk Assessment Guidance for Superfund. Vol. 1, Part E. July, 2004.

VOCs = volatile organic compounds.

(a) USEPA, 2004. Exhibit B-3 (Organics).

(b) USEPA, 2004. Exhibit 3-1. (Inorganics)

(c) Default for all other inorganics.

(d) Calculated. See equations below.

(e) USEPA, 2004. Equation A-4. Default value.

(f) USEPA, 2004. Exhibit B-2.

(g) Chemical identified as outside the effective prediction domain (EPD). Therefore, the dermal exposure pathway is not quantitatively evaluated, as discussed in the report text.

(h) See risk assessment report text for the evaluation of lead in groundwater.

(i) USEPA, 2020. Regional Screening Levels (RSLs) Calculator. May 2020.

(j) Value for trivalent chromium.

(k) Value for naphthalene.

(l) Value for 1,2,4-trichlorobenzene.

(m) Value for trans-1,2-dichloroethene.

Equations:

USEPA, 2004. Risk Assessment Guidance for Superfund. Volume 1, Part E, Supplemental Guidance for Dermal Risk Assessment

Equation 3.8:	$\text{Log Kp} = -2.80 + 0.66 \log \text{Kow} - 0.0056 \text{MW}$
Equation A.1:	$B = Kp \times MW^{0.5}/2.6$
Equation A.2:	$\text{Log Dsc/lsc} = -2.8-0.0056 \text{MW}$, where lsc = 1E-3 cm. Solving for Dsc: $Dsc = 10^{-2.8-0.0056\ MW} * lsc$.
Equation A.4:	$t = lsc^2/(6*Dsc)$
Equation A.5:	If $B \leq 0.6$, Equation A.5: $t^* = 2.4* t$
Equation A.6:	If $B > 0.6$: $t^* = (b- (b^2-c^2)^{0.5}) * l^2sc/(Dsc)$
Equation A-7:	$b = (2*(1+B)^2/p) -c$
Equation A-8:	$c = (1+3B+3B^2)/(3*(1+B))$

Definitions:

B - Relative Contribution of Permeability Coefficient.
Dsc - Effective diffusion coefficient through stratum corneum.
FA - Fraction Absorbed.
Kow - Octanol-Water Partition Coefficient.
Kp - Dermal Permeability Coefficient.
lsc - Apparent thickness of stratum corneum.
MW - Molecular Weight.
t - lag time (hr/event).
t* - Time to reach steady state.

Attachment E-2

Volatilization Factor Calculations

ATTACHMENT E-2, TABLE E-2.1
DEVELOPMENT OF DISPERSION FACTORS FOR THE SOIL TO OUTDOOR AIR PATHWAYS
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Area	A_c (acres)	Dispersion Factors (g/m^2-s per kg/m^3)			
		Volatiles in Excavation Scenario Q/C_{sa} (a)		Volatiles in Non-Excavation Scenario Q/C_{vol} (b)	
On-Project Blue Beach Area	12.43	8.13		43.33	
Off-Project Red Maple Swamp / Tidal Stream Area (Walking path)	0.95	12.67		65.95	
		Constants			
		A	2.4538	A	12.5907
		B	17.566	B	18.8368
		C	189.0426	C	215.4377

Notes:
USEPA = United States Environmental Protection Agency.
USEPA, 2002 = Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites.
(a) Calculated using Equation 5-15 (USEPA, 2002).
(b) Calculated using equation and constants listed in Exhibit D-3 (USEPA, 2002); Values for Zone 8, Hartford, CT.

ATTACHMENT E-2, TABLE E-2.2
SOIL AND EXPOSURE PARAMETERS USED IN THE DEVELOPMENT OF VOLATILIZATION FACTORS
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Parameter	Symbol	Units	Value	
Air-filled soil porosity	Oa	Lair/Lsoil	0.28	(a)
Water-filled soil porosity	Ow	Lwater/Lsoil	0.15	(a)
Total soil porosity	n	Lpore/Lsoil	0.43	(a)
Soil particle density	Ps	g/cm^3	2.65	(b)
Dry soil bulk density	Pb	g/cm^3	1.5	(b)
Organic carbon content	Foc	g/g	0.006	(b)
Exposure interval - Outdoor Worker	T	seconds	7.88E+08	(c)
Exposure interval - Recreational User/Hypothetical Future Resident	T	seconds	8.20E+08	(c)
Exposure interval - Trespasser	T	seconds	2.84E+08	(c)
Exposure interval - Construction Worker	T	seconds	3.15E+07	(c)
Dispersion Factor Correction for Construction Worker	Fd	unitless	1.85E-01	(d)

Notes:
USEPA = United States Environmental Protection Agency.
USEPA, 2002 = Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites.
(a) Default value obtained from Exhibit A-4 (USEPA, 2002).
(b) Default value obtained from Equation B-11 (USEPA, 2002).
(c) Exposure duration for each receptor converted to seconds.
(d) Default value obtained from Equation 5-14 (USEPA, 2002).

ATTACHMENT E-2, TABLE E-2.3
CHEMICAL-SPECIFIC PARAMETERS USED IN THE DEVELOPMENT OF VOLATILIZATION FACTORS
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Soil COPCs	CAS	Volatile? (a)	Solubility (a) (mg/L)	Soil-Water Partition Coefficient (K_d) (b) (L/kg)	Soil Organic Carbon-Water Partition Coefficient (K_{oc}) (a) (L/kg)	Henry's Law Constant (a) (dimensionless)	Diffusivity in Air (a) (cm^2/s)	Diffusivity in Water (a) (cm^2/s)	Apparent Diffusivity (c) (cm^2/s)	Soil Saturation (d) (mg/kg)
Inorganics										
Antimony	7440-36-0	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arsenic	7440-38-2	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cadmium	7440-43-9	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SVOCs										
Benzo(a)Pyrene	50-32-8	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	53-70-3	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PCBs										
Total PCB Aroclors	Tot-PCB-ARO	Yes	7.00E-01	4.69E+02	7.81E+04	1.70E-02	2.43E-02	6.27E-06	4.57E-08	3.28E+02
VOCs										
1,2,4-Trimethylbenzene	95-63-6	Yes	5.70E+01	3.69E+00	6.14E+02	2.52E-01	6.07E-02	7.92E-06	2.06E-04	2.18E+02
Ethylbenzene	100-41-4	Yes	1.69E+02	2.68E+00	4.46E+02	3.22E-01	6.85E-02	8.46E-06	4.03E-04	4.79E+02
Naphthalene	91-20-3	Yes	3.10E+01	9.26E+00	1.54E+03	1.80E-02	6.05E-02	8.38E-06	6.02E-06	2.90E+02
Total Xylenes	Tot-Xylenes	Yes	1.06E+02	2.30E+00	3.83E+02	2.71E-01	6.85E-02	8.46E-06	3.93E-04	2.59E+02
Trichloroethylene	79-01-6	Yes	1.28E+03	3.64E-01	6.07E+01	4.03E-01	6.87E-02	1.02E-05	2.65E-03	6.90E+02

Notes:
CAS = Chemical Abstracts Service.
COPC = Chemical of potential concern.
N/A = Not applicable; Non-volatile.
PCBs = Polychlorinated biphenyls.
SVOCs = Semivolatile organic compounds.
USEPA = United States Environmental Protection Agency.
USEPA, 2002 = Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites.
VOCs = Volatile organic compounds.
(a) USEPA Regional Screening Level (RSL) Chemical Properties Table. May 2020.
(b) $K_d = K_{oc} * f_{oc}$, where fraction organic carbon (f_{oc}) = 0.006, per Equation 4-8 (USEPA, 2002).
(c) Equation 4-8 (USEPA, 2002).
(d) Equation 4-9 (USEPA, 2002).

ATTACHMENT E-2, TABLE E-2.4
DEVELOPMENT OF VOLATILIZATION FACTORS FOR THE NON-EXCAVATION SCENARIOS (a)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical	CAS	On-Project Blue Beach Area			Off-Project Red Maple Swamp / Tidal Stream Area (Walking path)
		Outdoor Worker	Hypothetical Future Resident	Trespasser	Recreational User
		(m^3/kg)	(m^3/kg)	(m^3/kg)	(m^3/kg)
Q/C_{vol} Value (g/m^2-s per kg/m^3):		43.33	43.33	43.33	65.95
Inorganics					
Antimony	7440-36-0	N/A	N/A	N/A	NCOPC
Arsenic	7440-38-2	NCOPC	NCOPC	NCOPC	N/A
Cadmium	7440-43-9	N/A	N/A	N/A	NCOPC
SVOCs					
Benzo(a)Pyrene	50-32-8	NCOPC	NCOPC	NCOPC	N/A
Dibenzo(a,h)Anthracene	53-70-3	N/A	N/A	N/A	NCOPC
PCBs					
Total PCB Aroclors	Tot-PCB-ARO	3.36E+05	3.43E+05	2.02E+05	5.22E+05
VOCs					
1,2,4-Trimethylbenzene	95-63-6	5.00E+03	5.10E+03	3.00E+03	NCOPC
Ethylbenzene	100-41-4	3.58E+03	3.65E+03	2.15E+03	5.56E+03
Naphthalene	91-20-3	NCOPC	NCOPC	NCOPC	4.55E+04
Total Xylenes	Tot-Xylenes	3.63E+03	3.70E+03	2.18E+03	NCOPC
Trichloroethylene	79-01-6	1.39E+03	1.42E+03	8.37E+02	NCOPC

Notes:
CAS = Chemical Abstracts Service.
N/A = Not applicable; Non-volatile.
NCOPC = Not a chemical of potential concern in soil in the associated area.
PCBs = Polychlorinated biphenyls.
Q/C_{vol} = Dispersion factor for volatiles in a non-excavation scenario.
SVOCs = Semivolatile organic compounds.
USEPA = United States Environmental Protection Agency.
USEPA, 2002 = Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites.
VOCs = Volatile organic compounds.
(a) Equation 4-8 (and B-11) (USEPA, 2002). Q/C_{vol}, soil and chemical-specific parameters presented in Tables E-2.1 through E-2.3.

ATTACHMENT E-2, TABLE E-2.5
DEVELOPMENT OF VOLATILIZATION FACTORS FOR THE CONSTRUCTION WORKER (EXCAVATION SCENARIO)
REASONABLE MAXIMUM EXPOSURE
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Chemical	**CAS**	**On-Project Blue Beach Area (m^3/kg)**
Q/C_{sa} Value (g/m^2-s per kg/m^3) (a):		8.13
Inorganics		
Antimony	7440-36-0	N/A
Arsenic	7440-38-2	NCOPC
Cadmium	7440-43-9	N/A
SVOCs		
Benzo(a)Pyrene	50-32-8	NCOPC
Dibenzo(a,h)Anthracene	53-70-3	N/A
PCBs		
Total PCB Aroclors	Tot-PCB-ARO	6.82E+04
VOCs		
1,2,4-Trimethylbenzene	95-63-6	1.01E+03
Ethylbenzene	100-41-4	7.26E+02
Naphthalene	91-20-3	NCOPC
Total Xylenes	Tot-Xylenes	7.35E+02
Trichloroethylene	79-01-6	2.83E+02

Notes:
CAS = Chemical Abstracts Service.
N/A = Not applicable; Non-volatile.
NCOPC = Not a chemical of potential concern in soil in the associated area.
PCBs = Polychlorinated biphenyls.
Q/C_{sa} = Dispersion factor for volatiles in an excavation scenario.
SVOCs = Semivolatile organic compounds.
USEPA = United States Environmental Protection Agency.
USEPA, 2002 = Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites.
VOCs = Volatile organic compounds.
(a) Equation 5-14 (USEPA, 2002). Q/C_{vol}, soil and chemical-specific parameters presented in Tables E-2.1 through E-2.3.

Attachment E-3

Shower Air Modeling

Shower Air Modeling

The showering inhalation pathway requires modeling to derive exposure point concentrations. Foster and Chrostowski (1987) have presented a predictive model to estimate an indoor (bathroom) concentration. This theoretical approach is based on the experimental work of Andelman (1985), who measured air concentrations of trichloroethylene and chloroform in a bench scale shower assembly.

The shower model utilizes several assumptions, including a 12 cubic meter (m^3) bathroom volume and instant equilibrium in the air between the shower stall and the rest of the bathroom. The volumetric flow rate through the bathroom was assumed to be 0.1 m^3/min. This gives an effective air change rate of 0.5 air changes/hour (ACH). This value represents a reasonably conservative estimate given that median values for homes with closed windows is about 0.5 ACH (TRJ Environmental, 2002), and bathrooms with showers generally need a greater air exchange rate to remove moisture. No modifications were made to the model assumptions for this evaluation.

The model calculates the maximum concentrations, assuming that exposure time equals duration of the shower use. In reality, an individual would experience an integrated exposure that would gradually increase during shower usage and decrease again after the water was turned off. It was conservatively assumed that the peak concentration would persist for the entire duration of exposure.

The equation to calculate air concentrations in the bathroom is shown below:

$$C_{VOC} = \frac{S\,(e^{RDs} - 1)(e^{-Rt})}{R} \qquad \text{(Eq. 1)}$$

where:

C_{VOC}	=	bathroom VOC air concentration, ug/m^3
S	=	VOC source generation rate, ug/m^3- minute
R	=	air exchange rate of bathroom, min^{-1}
t	=	time at which concentration is being calculated, min
D_s	=	duration of shower, min

R, the air exchange rate, is calculated as the volumetric flow rate through the bathroom (m^3/min) divided by the volume of the bathroom (m^3).

S, the VOC source generation rate, is calculated based on the concentration of the compound in the water, emission of compound from a droplet, flow rate of water, and volume of room for dilution. S is calculated from the following series of equations:

$$S = \frac{C_{wd}\,Fr}{S_v} \qquad \text{(Eq. 2)}$$

where:

S	=	VOC source generation rate, ug/m^3-min
C_{wd}	=	concentration of VOC leaving the shower droplet, µg/l
F_r	=	water flow rate in shower, 10 liters/min
S_v	=	shower volume, 2.94 m^3

C_{wd} is calculated as follows:

$$C_{wd} = C_{wc} * (1 - e^{[(-KaL)(ts)/600d]}) \qquad \text{(Eq. 3)}$$

Where:

C_{wc} = concentration of VOC in water, µg/l
K_{aL} = temperature-connected mass transfer coefficient, cm/hr
t_s = shower droplet drop time, 2 sec
d = droplet diameter, 0.1 cm
1/600d = 6/d (mm) * (1 hr/3600 sec)

K_{aL} is calculated according to:

$$K_{aL} = K_L * [(T_1 * u_s)/(T_s * u_1)]^{-0.5} \quad \text{(Eq. 4)}$$

Where:

K_L = mass transfer coefficient at reference conditions (20°C and 1 atm), cm/hr
T_1 = reference temperature, 293°K
T_s = temperature of shower water, 318°K
u_1 = viscosity of water at reference temperature, 1.002 cp
u_s = viscosity of water at shower temperature, 0.5960 cp

K_L is calculated according to:

$$K_L = 1/[1/k_l + RT/(H\ k_g)] \quad \text{(Eq. 5)}$$

Where:

k_l = liquid-film mass transfer, cm/hr
k_g = gas-film mass transfer, cm/hr
H = Henry's Law constant, atm-m^3/mole
R = molar gas constant, 8.191×10^{-5} atm-m^3/mole-k
T = temperature, 293°K

The input values of k_l and k_g are based on the mass transfer coefficients of carbon dioxide (CO_2) and water. They are calculated for the particular chemical of potential concern (COPC) according to the following equations:

$$k_l = (kCO_2)\ [(44g/mole)/MW_{VOC}]^{0.5} \quad \text{(Eq. 6)}$$

$$k_g = (kH_2O)\ [(18g/mole)/MW_{VOC}]^{0.5} \quad \text{(Eq. 7)}$$

where:

kCO_2 = 20 cm/hr
kH_2O = 3,000 cm/hr
MW = molecular weight of COPC, g/mole

These equations were used to calculate bathroom air VOC concentrations derived from VOCs in groundwater, as presented in the table following this text. The air VOC concentrations were then used to calculate potential inhalation risks for the adult and child resident.

Uncertainties

There are uncertainties associated with the modeling of VOC volatilization from indoor water use for showering. Activity parameters that have uncertainty associated with them include shower durations and time spent in the room after a shower. Uncertain elements related to the modeling include chemical-specific input parameters (e.g., Henry's law constants), flow rate and temperature assumptions, and calculation of mass transfer coefficients. Measurement uncertainty is associated with some input parameters used in the model (e.g.,

droplet size) as well as the experimental data used to validate the model. Although the main source of VOCs in the air while showering is expected to be the shower spray itself, the conceptualization of the model as falling droplets only may result in an underestimation of modeled indoor concentrations (Foster and Chrostowski, 2003). The model also makes several conservative assumptions such as assuming exposure time equals duration of shower use and not accounting for the actual decrease in concentration after the water is turned off. Therefore, when all of the exposure and modeling assumptions are combined, it is much more likely that potential risks are significantly overestimated rather than underestimated.

References

Andelman, J.B. 1985. Human exposures to volatile halogenated organic chemicals in indoor and outdoor air. Environ. Health Persp. 62:313-318.

Foster, S.A. and P.C. Chrostowski. 1987. Inhalation exposures to volatile organic contaminants in the shower. APCA 80th Annual Meeting, New York, New York.

Foster, S.A. and P.C. Chrostowski. 2003. Integrated Human Exposure Model, Version 2 (IHEM2) For Volatile Organic Compounds. December 26, 2003.

ATTACHMENT E-3, TABLE E-3.1
CALCULATION OF CHEMICAL VAPOR CONCENTRATIONS IN SHOWER STALL AIR (a)
HUMAN HEALTH RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Non-Chemical Specific Parameters (a)	
Air exchange rate in shower stall (min^{-1}) ("R")	8.33E-03
Shower stall volume (m^3) ("S_v")	2.94
Duration of shower (min) ("t")	10
Water flow rate in shower (liters/min) ("F_r")	10
Shower droplet drop time (sec) ("t_s")	2
Shower droplet diameter (cm) ("d")	0.1
Calibration water temperature of transfer coefficient (^oK)	293
Shower water temperature (^oK)	318
Water viscosity at calibration temperature (cp)	1.002
Water viscosity at shower temperature (cp)	0.596
k_g for water (cm/hr)	3000
k_l for CO_2 (cm/hr)	20

Intermediate Calculations (a)	
Temperature correction factor for transfer rate	1.351
Gas constant ("R") (atm m^3/(g-mole ^oK))	8.20E-05
"RT" (atm m^3/g-mole)	2.40E-02

Chemical (b)	**CAS**	**Unit Concentration in water (µg/L)**	**Molecular Weight (g/mole) (c)**	**Henry's Law Constant (atm m^3/g-mole) (c)**	**k_g (cm/hr)**	**k_l (cm/hr)**	**K_L (cm/hr)**	**K_L' (cm/hr)**	**C_{wd} (µg/L)**	**"S" (µg/(m^3 min))**	**Air Concentration Associated with Unit Groundwater Concentration: C_{voc} (µg/m^3)**
1,1,2,2-Tetrachloroethane	79-34-5	1.00	1.68E+02	3.67E-04	9.82E+02	1.02E+01	6.09E+00	8.22E+00	2.40E-01	8.15E-01	7.82E+00
1,1,2-Trichloroethane	79-00-5	1.00	1.33E+02	8.24E-04	1.10E+03	1.15E+01	8.81E+00	1.19E+01	3.27E-01	1.11E+00	1.07E+01
1,1-Dichloroethane	75-34-3	1.00	9.90E+01	5.62E-03	1.28E+03	1.33E+01	1.28E+01	1.72E+01	4.37E-01	1.49E+00	1.43E+01
1,2,4-Trimethylbenzene	95-63-6	1.00	1.20E+02	6.16E-03	1.16E+03	1.21E+01	1.16E+01	1.57E+01	4.08E-01	1.39E+00	1.33E+01
1,2-Dichloropropane	78-87-5	1.00	1.13E+02	2.82E-03	1.20E+03	1.25E+01	1.15E+01	1.55E+01	4.03E-01	1.37E+00	1.32E+01
1-Methylnaphthalene	90-12-0	1.00	1.42E+02	5.14E-04	1.07E+03	1.11E+01	7.48E+00	1.01E+01	2.86E-01	9.73E-01	9.33E+00
2-Methylnaphthalene	91-57-6	1.00	1.42E+02	5.18E-04	1.07E+03	1.11E+01	7.50E+00	1.01E+01	2.87E-01	9.75E-01	9.35E+00
Benzo(a)anthracene	56-55-3	1.00	2.28E+02	1.20E-05	8.42E+02	8.78E+00	4.01E-01	5.42E-01	1.79E-02	6.09E-02	5.85E-01
Chloroform	67-66-3	1.00	1.19E+02	3.67E-03	1.16E+03	1.21E+01	1.14E+01	1.54E+01	4.01E-01	1.36E+00	1.31E+01
cis-1,2-Dichloroethene	156-59-2	1.00	9.69E+01	4.08E-03	1.29E+03	1.35E+01	1.27E+01	1.71E+01	4.35E-01	1.48E+00	1.42E+01
Ethylbenzene	100-41-4	1.00	1.06E+02	7.88E-03	1.24E+03	1.29E+01	1.25E+01	1.69E+01	4.30E-01	1.46E+00	1.40E+01
Naphthalene	91-20-3	1.00	1.28E+02	4.40E-04	1.12E+03	1.17E+01	7.47E+00	1.01E+01	2.86E-01	9.71E-01	9.32E+00
Tetrachloroethene	127-18-4	1.00	1.66E+02	1.77E-02	9.88E+02	1.03E+01	1.02E+01	1.37E+01	3.67E-01	1.25E+00	1.20E+01
Total Xylenes	Tot-Xylenes	1.00	1.06E+02	6.63E-03	1.24E+03	1.29E+01	1.24E+01	1.68E+01	4.28E-01	1.46E+00	1.40E+01
Trichloroethylene	79-01-6	1.00	1.31E+02	9.85E-03	1.11E+03	1.16E+01	1.13E+01	1.52E+01	3.98E-01	1.36E+00	1.30E+01
Vinyl Chloride	75-01-4	1.00	6.25E+01	2.78E-02	1.61E+03	1.68E+01	1.66E+01	2.25E+01	5.27E-01	1.79E+00	1.72E+01

Notes:

(a) The Foster and Chrostowski (1987) shower model was used to estimate an indoor (bathroom) air vapor concentration. The model is based on the experimental work of Andelman (1985), who measured air concentrations of trichloroethylene and chloroform in a bench scale shower assembly.

(b) Includes chemicals of potential concern in groundwater that are defined as volatile based on the USEPA Regional Screening Level (RSL) Table (May 2020).

(c) Obtained from the USEPA Regional Screening Level (RSL) tables (May 2020). Remaining parameters calculated by the Foster and Chrostowski model, referenced below.

References:

Andelman, J.B. 1985. Human exposures to volatile halogenated organic chemicals in indoor and outdoor air. Environ. Health Persp. 62:313-318.

Foster, S.A. and P.C. Chrostowski. 1987. Inhalation exposures to volatile organic contaminants in the shower. APCA 80th Annual Meeting, New York, New York.

Attachment E-4

Excavation Trench Air Modeling

CALCULATION OF EXCAVATION AIR VOC ATTENUATION FACTORS FROM STANDING WATER-EXCAVATION TRENCH

Excavation trench air concentrations of a COPC resulting from volatilization from groundwater and leachate infiltrating an excavation trench can be predicted by the use of the method recommended by USEPA (1994) for predicting volatilization from standing water.

Air Concentration

In this model, the air concentration of a COPC is estimated at the downwind boundary of the water. For the purposes of calculating this concentration, a rectangular box with the base corresponding to the water surface is considered. The height of the box, H_b, is the height to which the chemical emissions from the water surface are uniformly mixed with the air. W_b is the width of the box perpendicular to the airflow. If U is the wind speed along the length of the trench, then, by conservation of mass, the air concentration, C_a, of chemical within the box is given by:

$$C_a = \frac{Q}{H_b W_b U} \quad (1)$$

The diffusion height, Hb, above the water surface is approximately equal to 5% of the length of the trench, i.e., parallel to the wind flow (Jackson, 1976). If the length of the trench is expressed as the surface area of the water on the bottom of the trench divided by the trench width, the equation for the air concentration becomes:

$$C_a = \frac{Q}{0.05\,AU} \quad (2)$$

where:

Q = chemical emission rate (g/s)

A = water surface area (m^2)

U = wind speed along the trench (m/s)

The chemical emission rate, Q, can be expressed as follows:

$$Q = KAC_L \quad (3)$$

where:

Q = chemical emission rate (g/s)

K = overall mass transfer coefficient (m/s)

A = water surface area (m^2)

C_L = chemical concentration in water (g/m^3)

With the substitution of equation (3) into equation (2), the equation for air concentration simplifies to:

$$C_a = \frac{KC_L}{0.05\,U} \quad (4)$$

For the purpose of calculating the concentration in air from a given concentration in water, it is convenient to use this equation to define an attenuation factor, α, defined as the ratio of the airborne concentration of the COPC above the water to the COPC concentration in the water. If the air and water COPC concentrations are in the same units α is dimensionless. If, as is common practice, the concentration in water is expressed in mass units per liter (L) and the air concentration is expressed as mass units per cubic meter (m^3), then the attenuation factor can be expressed as:

$$\alpha\,(L/m^3) = \frac{20000K}{U} \qquad (5)$$

In applying the attenuation factor, the computation of the COPC air concentration requires the COPC concentration in water, wind speed and mass transfer coefficient.

Mass Transfer Coefficient

Volatilization is considered the primary pathway of mass transfer from the liquid to the vapor phase. It occurs when molecules of a dissolved substance escape to the gas phase due to a concentration gradient. The mass transfer coefficient is defined by USEPA (1994) as follows:

$$K = \left[\frac{1}{k_l^o \left(\frac{D_l^c}{D_l^o} \right)^m} + \frac{RT}{(10^6) H \; k_g^w \left(\frac{D_g^c}{D_g^w} \right)^n} \right]^{-1} \qquad (6)$$

Where:

k_l^o = mass transfer coefficient of oxygen in water, cm/s;

D_l = diffusivity of the chemical (c) or oxygen (o) in water, cm^2/s;

m = liquid turbulence exponent, 0.5 to 1, dimensionless;

R = ideal gas constant, atm cm^3/ (mol.K);

T = temperature, K;

H = Henry's law constant, atm m^3/mol;

k_w^g = mass transfer coefficient for water vapor in air, cm/s;

D_g = diffusivity of the chemical (c) or water (w) in air, cm^2/s;

n = gas turbulence exponent, 0.5 to 1.0, dimensionless

The elements of this equation can be described by:

$$K = \left[\frac{1}{K_L} + \frac{1}{K_G K_{eq}} \right]^{-1} \qquad (7)$$

where,

K_L = Liquid phase mass transfer coefficient, cm/s;

K_G = Gas phase mass transfer coefficient, cm/s;

K_{eq} = Equilibrium mass transfer coefficient, unitless;

K_L, K_G and K_{eq} may be expressed as follows:

$$K_{eq} = \frac{H}{RT} \quad (8)$$

$$K_L = k_l^o \left(\frac{D_l^c}{D_l^o} \right)^m \quad (9)$$

$$K_G = k_g^w \left(\frac{D_g^c}{D_g^o} \right)^n \quad (10)$$

Equation 6 requires values of diffusion coefficients and Henry's law constants which are presented in the accompanying table. The constants used in Equation 6 are presented below.

Values of Constants for use in Equation 6 (Source: USEPA (1994), Table 2-1):

Constant	Value for Lakes
k_l^o (cm/s)	0.0005
m	1.0
T (K)	293
RT (cm^3.atm/mol)	24042.4
k_w^g (cm/s)	0.58
n	0.7

Model Applications and Results

The accompanying table provides model inputs and the intermediate steps in the process of modeling the attenuation factor. A surface wind speed of 2.25 m/s was applied (ASTM, 1994).

References

ASTM International, 2004. Standard Guide for Risk-Based Corrective Action. Table X3.2. Value for ambient air velocity in mixing zone.

Jackson, N.A. 1976. The Propagation of Modified Flow Downstream of a Change in Roughness. Quarterly Journal of the Royal Meteorological Society. 102:924.

USEPA 1994. Air Emissions Models for Waste and Wastewater. EPA-453/R-94-080A. November 1994.

ATTACHMENT E-4, TABLE E-4.1
DEVELOPMENT OF ATTENUATION FACTORS FOR THE GROUNDWATER TO EXCAVATION TRENCH AIR PATHWAY
BLUE BEACH DISPOSAL AREA
HUMAN HEALTH RISK ASSESSMENT
NORTH KINGSTOWN, RHODE ISLAND

Assumption: Losses from a trench occur in a manner similar to volatilization losses from a lake; using equation 2-4 from the "Air Emissions Models for the Waste and Wastewater"; EPA, Nov. 1994. The overall mass transfer coefficient, K is calculated as follows:

$$K = [1/(k_l^{\circ} * (D_l^{c}/D_l^{\circ})^{m}) + (RT/(10^{6}*H*K_g^{w}*(D_g^{c}/D_g^{w})^{n}))]^{-1} \text{ ------ (1) (a)}$$

$$K = (B+C)^{-1} \text{ ; Where}$$

$$B = 1/(k_l^{\circ} * (D_l^{c}/D_l^{\circ})^{m}) \text{ and}$$

$$C = (RT/(10^{6}*H*K_g^{w}*(D_g^{c}/D_g^{w})^{n}))$$

Input Parameters	
Wind speed (m/s) (d)	2.25

(b) Table 1: Values of Constants for Use in Equation (1)

Parameter	Value for Lakes	Units	
K_l°	5.00E-04	cm/s	mass transfer coefficient of oxygen in water
R	8.21E+01	cm^3*atm/(mol*K)	ideal gas constant
T	2.93E+02	K	Temperature
RT	2.40E+04	cm^3*atm/mol	R times T
K^w_g	5.80E-01	cm/s	mass transfer coefficient for water vapor in air
n	7.00E-01	N/A	gas turbulence exponent
D_l°	2.20E-05	cm^2/s	diffusivity of oxygen in air
D_g^{w}	2.14E-01	cm^2/s	diffusivity of oxygen in water
m	1.00E+00	N/A	liquid turbulence exponent

Chemical (e)	CAS Number	Molecular Weight (c) (g/mol)	Henry's Law Constant (c) ($atm*m^3$/mole)	Diffusivity In Air (c) (cm^2/s)	Diffusivity In Water (c) (cm^2/s)	$B = 1/(k_l^{\circ} * (D_l^{c}/D_l^{\circ})^{m}$	$C = RT/10^{6}*H*K_g^{w}*(D_g^{c}/D_g^{w})^{n}$	$K = (B+C)^{-1}$ (cm/s)	K (m/s)	Groundwater to air attenuation factor (L/m^3)
1,2,4-Trimethylbenzene	95-63-6	1.20E+02	6.16E-03	6.07E-02	7.92E-06	5.55E+03	1.63E+01	1.79E-04	1.79E-06	1.60E-02
1,2-Dichloropropane	78-87-5	1.13E+02	2.82E-03	7.33E-02	9.73E-06	4.52E+03	3.11E+01	2.20E-04	2.20E-06	1.95E-02
1-Methylnaphthalene	90-12-0	1.42E+02	5.14E-04	5.28E-02	7.85E-06	5.61E+03	2.15E+02	1.72E-04	1.72E-06	1.53E-02
2-Methylnaphthalene	91-57-6	1.42E+02	5.18E-04	5.24E-02	7.78E-06	5.65E+03	2.14E+02	1.70E-04	1.70E-06	1.51E-02
Benzo(a)anthracene	56-55-3	2.28E+02	1.20E-05	2.61E-02	6.75E-06	6.52E+03	1.51E+04	4.63E-05	4.63E-07	4.12E-03
cis-1,2-Dichloroethene	156-59-2	9.69E+01	4.08E-03	8.84E-02	1.13E-05	3.88E+03	1.89E+01	2.56E-04	2.56E-06	2.28E-02
Ethylbenzene	100-41-4	1.06E+02	7.88E-03	6.85E-02	8.46E-06	5.20E+03	1.17E+01	1.92E-04	1.92E-06	1.70E-02
Naphthalene	91-20-3	1.28E+02	4.40E-04	6.05E-02	8.38E-06	5.25E+03	2.28E+02	1.82E-04	1.82E-06	1.62E-02
Total Xylenes	Tot-Xylenes	1.06E+02	6.63E-03	6.85E-02	8.46E-06	5.20E+03	1.39E+01	1.92E-04	1.92E-06	1.71E-02
Trichloroethylene	79-01-6	1.31E+02	9.85E-03	6.87E-02	1.02E-05	4.30E+03	9.33E+00	2.32E-04	2.32E-06	2.06E-02

Notes:
CAS = Chemical Abstracts Service.
(a) Equation 2-4 of section 2-2 of the "Air Emissions Models for Waste and Wastewater", 1994; EPA-453/R-94-080A.
(b) Table 2-1 of section 2-2 of the "Air Emissions Models for Waste and Wastewater", 1994; EPA-453/R-94-080A; For Lakes.
(c) Parameters taken from the USEPA (May 2020) Regional Screening Level (RSL) tables.
(d) ASTM International, 2004. Standard Guide for Risk-Based Corrective Action. Table X3.2. Value for ambient air velocity in mixing zone.
(e) Includes chemicals of potential concern in shallow groundwater that are defined as volatile based on the USEPA Regional Screening Level (RSL) Table (May 2020).

Attachment E-5

Vapor Intrusion Screening Level Calculator Output

Site-specific VISL Results
Resident Equation Inputs

*** Inputted values different from Resident defaults are highlighted.**
Output generated 01OCT2020:09:44:55

Variable	Resident Air Default Value	Form-input Value
AF_{gw} (Attenuation Factor Groundwater) unitless	0.001	0.001
AF_{ss} (Attenuation Factor Sub-Slab) unitless	0.03	0.03
ED_{res} (exposure duration) years	26	26
ED_{0-2} (mutagenic exposure duration first phase) years	2	2
ED_{2-6} (mutagenic exposure duration second phase) years	4	4
ED_{6-16} (mutagenic exposure duration third phase) years	10	10
ED_{16-26} (mutagenic exposure duration fourth phase) years	10	10
EF_{res} (exposure frequency) days/year	350	350
EF_{0-2} (mutagenic exposure frequency first phase) days/year	350	350
EF_{2-6} (mutagenic exposure frequency second phase) days/year	350	350
EF_{6-16} (mutagenic exposure frequency third phase) days/year	350	350
EF_{16-26} (mutagenic exposure frequency fourth phase) days/year	350	350
ET_{res} (exposure time) hours/day	24	24
ET_{0-2} (mutagenic exposure time first phase) hours/day	24	24
ET_{2-6} (mutagenic exposure time second phase) hours/day	24	24
ET_{6-16} (mutagenic exposure time third phase) hours/day	24	24
ET_{16-26} (mutagenic exposure time fourth phase) hours/day	24	24
THQ (target hazard quotient) unitless	0.1	0.1
LT (lifetime) years	70	70
TR (target risk) unitless	1.0E-06	1.0E-06

Resident Vapor Intrusion Screening Levels (VISL)

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; U = user provided; G = see RSL User's Guide Section 5; CA = cancer; NC = noncancer.

Chemical	CAS Number	Does the chemical meet the definition for volatility? (HLC>1E-5 or VP>1)	Does the chemical have inhalation toxicity data? (IUR and/or RfC)	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Soil Source? ($C_{vp} > C_{i,a}$,Target?)	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Groundwater Source? ($C_{hc} > C_{i,a}$,Target?)	Target Indoor Air Concentration (TCR=1E-06 or THQ=0.1) MIN($C_{ia,c}$,$C_{ia,nc}$) ($\mu g/m^3$)	Toxicity Basis
Benzene	71-43-2	Yes	Yes	Yes	Yes	3.60E-01	CA
Heptane, N-	142-82-5	Yes	Yes	Yes	Yes	4.17E+01	NC
Vinyl Chloride	75-01-4	Yes	Yes	Yes	Yes	1.68E-01	CA

Chemical	Target Sub-Slab and Near-source Soil Gas Concentration (TCR=1E-06 or THQ=0.1) C_{sg},Target ($\mu g/m^3$)	Target Groundwater Concentration (TCR=1E-06 or THQ=0.1) C_{gw},Target ($\mu g/L$)	Is Target Groundwater Concentration < MCL? (C_{gw} < MCL?)	Pure Phase Vapor Concentration C_{vp}\ (25 °C)\ ($\mu g/m^3$)	Maximum Groundwater Vapor Concentration C_{hc}\ ($\mu g/m^3$)	Temperature for Maximum Groundwater Vapor Concentration (°C)	Lower Explosive Limit LEL (% by volume)
Benzene	1.20E+01	1.59E+00	Yes (5)	3.98E+08	4.06E+08	25	1.20
Heptane, N-	1.39E+03	5.10E-01	--	2.48E+08	2.78E+08	25	1.05
Vinyl Chloride	5.59E+00	1.47E-01	Yes (2)	1.00E+10	1.00E+10	25	3.60

Chemical	LEL Ref	IUR $(ug/m^3)^{-1}$	IUR Ref	RfC (mg/m^3)	RfC Ref	Mutagenic Indicator	Carcinogenic VISL TCR=1E-06 $C_{ia,c}$ ($\mu g/m^3$)	Noncarcinogenic VISL THQ=0.1 $C_{ia,nc}$ ($\mu g/m^3$)
Benzene	CRC89	7.80E-06	I	3.00E-02	I	No	3.60E-01	3.13E+00
Heptane, N-	CRC89			4.00E-01	P	No		4.17E+01
Vinyl Chloride	CRC89	4.40E-06	I	1.00E-01	I	Mut	1.68E-01	1.04E+01

Chemical	CAS Number	Site Sub-Slab and Exterior Soil Gas Concentration C_{sg} \ ($\mu g/m^3$)	Site Indoor Air Concentration $C_{i,a}$ \ ($\mu g/m^3$)	VI Carcinogenic Risk CDI ($\mu g/m^3$)	VI Carcinogenic Risk CR	VI Hazard CDI (mg/m^3)	VI Hazard HQ	IUR $(ug/m^3)^{-1}$
Benzene	71-43-2	160	4.80E+00	1.71E+00	1.33E-05	4.60E-03	1.53E-01	7.80E-06
Heptane, N-	142-82-5	1400	4.20E+01	1.50E+01		4.03E-02	1.01E-01	
Vinyl Chloride	75-01-4	180	5.40E+00	7.32E+00	3.22E-05	5.18E-03	5.18E-02	4.40E-06
**Sum*					*4.56E-05*		*3.06E-01*	

Chemical	IUR Ref	Chronic RfC (mg/m^3)	RfC Ref	Temperature (℃)\ for Groundwater Vapor Concentration	Mutagen?
Benzene	I	3.00E-02	IRIS	25	No
Heptane, N-		4.00E-01	PPRTV	25	No
Vinyl Chloride	I	1.00E-01	IRIS	25	Mut
**Sum*					

Chemical	CAS Number	Does the chemical meet the definition for volatility? (HLC>1E-5 or VP>1)	Does the chemical have inhalation toxicity data? (IUR and/or RfC)	MW	MW Ref	Vapor Pressure VP (mm Hg)	VP Ref	S (mg/L)	S Ref	MCL (ug/L)	HLC (atm-m^3/mole)
Benzene	71-43-2	Yes	Yes	78.12	PHYSPROP	9.48E+01	PHYSPROP	1.79E+03	PHYSPROP	5	5.55E-03
Heptane, N-	142-82-5	Yes	Yes	100.21	PHYSPROP	4.60E+01	PHYSPROP	3.40E+00	PHYSPROP		2.00E+00
Vinyl Chloride	75-01-4	Yes	Yes	62.50	PHYSPROP	2.98E+03	EPI	8.80E+03	PHYSPROP	2	2.78E-02

Chemical	Henry's Law Constant (unitless)	H` and HLC Ref	Henry's Law Constant Used in Calcs (unitless)	Normal Boiling Point BP (K)	BP Ref	Critical Temperature TC (K)	TC Ref	Enthalpy of vaporization at the normal boiling point $\Delta H_{v,b}$\ (cal/mol)	$\Delta H_{v,b}$\ Ref	Lower Explosive Limit LEL (% by volume)	LEL Ref
Benzene	2.27E-01	PHYSPROP	2.27E-01	353.15	PHYSPROP	5.62E+02	CRC89	7342.26	CRC89	1.20	CRC89
Heptane, N-	8.18E+01	EPI	8.18E+01	371.65	PHYSPROP	5.40E+02	CRC89	7593.21	CRC89	1.05	CRC89
Vinyl Chloride	1.14E+00	PHYSPROP	1.14E+00	259.85	PHYSPROP	4.25E+02	CRC89	4971.32	CRC89	3.60	CRC89

Site-specific VISL Results
Commercial Equation Inputs

*** Inputted values different from Commercial defaults are highlighted.**
Output generated 14OCT2020:15:40:49

Variable	Commercial Air Default Value	Form-input Value
AF_{gw} (Attenuation Factor Groundwater) unitless	0.001	0.001
AF_{ss} (Attenuation Factor Sub-Slab) unitless	0.03	0.03
AT_{w} (averaging time - composite worker)	365	365
ED_{w} (exposure duration - composite worker) yr	25	25
EF_{w} (exposure frequency - composite worker) day/yr	250	250
ET_{w} (exposure time - composite worker) hr	8	8
THQ (target hazard quotient) unitless	0.1	0.1
LT (lifetime) yr	70	70
TR (target risk) unitless	1.0E-06	1.0E-06

Commercial Vapor Intrusion Screening Levels (VISL)

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; U = user provided; G = see RSL User's Guide Section 5; CA = cancer; NC = noncancer.

Chemical	CAS Number	Does the chemical meet the definition for volatility? (HLC>1E-5 or VP>1)	Does the chemical have inhalation toxicity data? (IUR and/or RfC)	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Soil Source? (C_{vp} > $C_{i,a}$,Target?)	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Groundwater Source? (C_{hc} > $C_{i,a}$,Target?)	Target Indoor Air Concentration (TCR=1E-06 or THQ=0.1) MIN($C_{ia,c}$,$C_{ia,nc}$) (µg/m³)	Toxicity Basis
Benzene	71-43-2	Yes	Yes	Yes	Yes	1.57E+00	CA
Heptane, N-	142-82-5	Yes	Yes	Yes	Yes	1.75E+02	NC
Vinyl Chloride	75-01-4	Yes	Yes	Yes	Yes	2.79E+00	CA

Chemical	Target Sub-Slab and Near-source Soil Gas Concentration (TCR=1E-06 or THQ=0.1) C_{sg},Target (µg/m³)	Target Groundwater Concentration (TCR=1E-06 or THQ=0.1) C_{gw},Target (µg/L)	Is Target Groundwater Concentration < MCL? (C_{gw} < MCL?)	Pure Phase Vapor Concentration C_{vp}\ (25 °C)\ (µg/m³)	Maximum Groundwater Vapor Concentration C_{hc}\ (µg/m³)	Temperature for Maximum Groundwater Vapor Concentration (°C)	Lower Explosive Limit LEL (% by volume)
Benzene	5.24E+01	6.93E+00	No (5)	3.98E+08	4.06E+08	25	1.20
Heptane, N-	5.84E+03	2.14E+00	--	2.48E+08	2.78E+08	25	1.05
Vinyl Chloride	9.29E+01	2.45E+00	No (2)	1.00E+10	1.00E+10	25	3.60

Chemical	LEL Ref	IUR (ug/m³)$^{-1}$	IUR Ref	RfC (mg/m³)	RfC Ref	Mutagenic Indicator	Carcinogenic VISL TCR=1E-06 $C_{ia,c}$ (µg/m³)	Noncarcinogenic VISL THQ=0.1 $C_{ia,nc}$ (µg/m³)
Benzene	CRC89	7.80E-06	I	3.00E-02	I	No	1.57E+00	1.31E+01
Heptane, N-	CRC89			4.00E-01	P	No		1.75E+02
Vinyl Chloride	CRC89	4.40E-06	I	1.00E-01	I	Mut	2.79E+00	4.38E+01

Chemical	CAS Number	Site Sub-Slab and Exterior Soil Gas Concentration C_{sg} \ ($\mu g/m^3$)	Site Indoor Air Concentration $C_{i,a}$ \ ($\mu g/m^3$)	VI Carcinogenic Risk CDI ($\mu g/m^3$)	VI Carcinogenic Risk CR	VI Hazard CDI (mg/m^3)	VI Hazard HQ	IUR $(ug/m^3)^{-1}$
Benzene	71-43-2	160	4.80E+00	3.91E-01	3.05E-06	1.10E-03	3.65E-02	7.80E-06
Heptane, N-	142-82-5	1400	4.20E+01	3.42E+00		9.59E-03	2.40E-02	
Vinyl Chloride	75-01-4	180	5.40E+00	4.40E-01	1.94E-06	1.23E-03	1.23E-02	4.40E-06
**Sum*					*4.99E-06*		*7.28E-02*	

Chemical	IUR Ref	Chronic RfC (mg/m^3)	RfC Ref	Temperature (℃)\ for Groundwater Vapor Concentration	Mutagen?
Benzene	I	3.00E-02	IRIS	25	No
Heptane, N-		4.00E-01	PPRTV	25	No
Vinyl Chloride	I	1.00E-01	IRIS	25	Mut
**Sum*					

Chemical	CAS Number	Does the chemical meet the definition for volatility? (HLC>1E-5 or VP>1)	Does the chemical have inhalation toxicity data? (IUR and/or RfC)	MW	MW Ref	Vapor Pressure VP (mm Hg)	VP Ref	S (mg/L)	S Ref	MCL (ug/L)	HLC (atm-m^3/mole)
Benzene	71-43-2	Yes	Yes	78.12	PHYSPROP	9.48E+01	PHYSPROP	1.79E+03	PHYSPROP	5	5.55E-03
Heptane, N-	142-82-5	Yes	Yes	100.21	PHYSPROP	4.60E+01	PHYSPROP	3.40E+00	PHYSPROP		2.00E+00
Vinyl Chloride	75-01-4	Yes	Yes	62.50	PHYSPROP	2.98E+03	EPI	8.80E+03	PHYSPROP	2	2.78E-02

Chemical	Henry's Law Constant (unitless)	H` and HLC Ref	Henry's Law Constant Used in Calcs (unitless)	Normal Boiling Point BP (K)	BP Ref	Critical Temperature TC (K)	TC Ref	Enthalpy of vaporization at the normal boiling point $\Delta H_{v,b}$\ (cal/mol)	$\Delta H_{v,b}$\ Ref	Lower Explosive Limit LEL (% by volume)	LEL Ref
Benzene	2.27E-01	PHYSPROP	2.27E-01	353.15	PHYSPROP	5.62E+02	CRC89	7342.26	CRC89	1.20	CRC89
Heptane, N-	8.18E+01	EPI	8.18E+01	371.65	PHYSPROP	5.40E+02	CRC89	7593.21	CRC89	1.05	CRC89
Vinyl Chloride	1.14E+00	PHYSPROP	1.14E+00	259.85	PHYSPROP	4.25E+02	CRC89	4971.32	CRC89	3.60	CRC89

Attachment F

Site Photographs

Photo – 1

Facing south towards Narragansett Bay. Image of open area between the Goldline building (left) and the forested area bordering the Red Maple Swamp (right). Note the mowed lawn closest to building.

Photo taken: August 2011

Photo – 2

Facing west towards the forested area bordering the Red Maple Swamp.

Photo taken: August 2011

Photo – 3

Facing north across Red Maple Swamp. Habitat is a mix of *Phragmites* and *Spartina* grasses and low shrubs.

Photo taken: August 2011

Photo – 4

Facing northwest across Red Maple Swamp. Saltmeadow cordgrass (*Spartina patens*) covers much of the open area.

Photo taken: August 2011

Photo – 5

Tidal stream within the Red Maple Swamp surrounded by saltmeadow cordgrass and smooth cordgrass (*S. alterniflora*)

Photo taken: August 2011

Photo – 6

Facing west towards public beachfront located to the west of the Property. Stone riprap is located along the shoreline of the Property.

Photo taken: August 2011

Photo – 7

Upland area between Goldline building and Narragansett Bay. Habitat is a mix of grasses and low shrubs.

Photo taken: August 2011

Photo – 8

Facing west from shoreline in front of Goldline building. Stone riprap is located along the shoreline of the Property.

Photo taken: August 2011

Photo – 9

Upland area at the eastern end of the Property facing west. Habitat is a mix of grasses and low shrubs. Goldline building is in upper right corner.

Photo taken: August 2011

Attachment G

Ecological Risk Assessment Supporting Tables

Attachment G-1

Screening Food Web Model – On-Project Blue Beach Area

ATTACHMENT G-1
SCREENING LEVEL FOOD WEB MODEL - ON-PROJECT BLUE BEACH AREA
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BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

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TABLE 10 REFERENCES CITED FOR THE ON-PROJECT BLUE BEACH AREA FOOD WEB MODEL

ATTACHMENT G-1 TABLE 1
EXPOSURE PARAMETERS FOR WILDLIFE RECEPTORS FOR ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Receptor Species	Body Weight (kg)	Food Ingestion Rate (kg_{dw}/day)	Dietary Assumptions (%; kg_{dw}/day)		Incidental Soil Ingestion (%; kg_{dw}/day)	Average Home Range (acres)
			Soil Invertebrates	Terrestrial Plants		
Birds						
American robin *(Turdus migratorius)*	0.0804 [a]	0.0119 [b]	100% [c] 0.0119	-- --	6.4% [d] 0.0008	0.6095 [e]
Bobwhite quail *(Colinus virginianus)*	0.1751 [a]	0.0088 [b]	-- --	100% [c] 0.0088	6.1% [d] 0.00054	24.7 [e]
Mammals						
Raccoon *(Procyon lotor)*	5.78 [a]	0.1535 [b]	58% [c] 0.0890	42% [c] 0.0645	9.4% [d] 0.014	1558 [e]
Meadow vole *(Microtus pennsylvanicus)*	0.033 [a]	0.0077 [b]	-- --	100% [c] 0.0077	1.2% [d] 0.000093	0.066 [e]
Short-tailed shrew *(Blarina brevicauda)*	0.0161 [a]	0.0021 [b]	100% [c] 0.0021	-- --	0.9% [d] 0.000019	0.96 [e]

General Notes:

BW - Body Weight g - grams

DW - Dry Weight kg - kilograms

FIR - Food Ingestion Rate L - liters

Notes continued on following page.

Notes for American robin

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for insectivorous birds developed by Nagy, 2001 [FIR (gdw/day) = $0.540*BW^{0.705}$] using average body weight.

[c] Diet assumed to be exclusively soil invertebrates.

[d] In the absence of data for the robin, the incidental soil ingestion rate is based on 50th percentile value for woodcock (USEPA, 2007a).

[e] Home range listed by USEPA (1993) ranges from 0.27 to 1.04 acres with an average of 0.6095 acres.

ATTACHMENT G-1 TABLE 1
EXPOSURE PARAMETERS FOR WILDLIFE RECEPTORS FOR ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Notes for Bobwhite quail

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for quail birds developed by Nagy, 2001 [FIR (gdw/day) = $0.088*BW^{0.891}$] using average body weight.

[c] Diet assumed to be exclusively plants.

[d] In the absence of data for the quail, the incidental soil ingestion rate is based on 50th percentile value for mourning dove (USEPA, 2007a).

[e] Home range listed by USEPA (1993) ranges from 8.9 to 41.3 acres with an average of 24.7 acres.

Notes for Raccoon

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for omnivorous mammals developed by Nagy, 2001 [FIR (g_{dw}/day) = $0.432*BW^{0.678}$] using average body weight.

[c] Diet composition based on the average of seasonal diets for raccoon in a Maryland forested bottomland (USEPA, 1993). Amphibian component of diet (12%) added to soil invertebrat

[d] The incidental soil ingestion rate is based on the value identified by Beyer (1994) for raccoons.

[e] Home range listed by USEPA (1993) ranges from 96 to 6325 acres with an average of 1558 acres.

Meadow vole

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for herbivorous mammals developed by Nagy, 2001 [FIR (kg_{dw}/day) = $0.859*BW^{0.628}$] using average body weight.

[c] Diet is expected to be composed entirely of plants.

[d] The incidental soil ingestion rate is based on 50th percentile value for vole (USEPA, 2007a).

[e] Home range listed by USEPA (1993) ranges from 0.000494 to 0.2051 acres with an average of 0.0659 acres.

Notes for Short-tailed Shrew

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for insectivorous mammals developed by Nagy, 2001 [FIR (kg_{dw}/day) = $0.373*BW^{0.622}$] using average body weight.

[c] An exclusive soil invertebrate diet was selected.

[d] The incidental soil ingestion rate is based on 50^{th} percentile value for shrew (USEPA, 2007a).

[e] Average home range for short-tailed shrew in Michigan, Manitoba, and New York (USEPA, 1993).

ATTACHMENT G-1 TABLE 2

MEDIA AND TISSUE CONCENTRATIONS IN THE ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	Measured Media Concentrations [a]	**Estimated Soil Invertebrate Tissue**			**Estimated Plant Tissue**		
COPC	Maximum Detected Soil Concentration (mg/kg_{dw})	Soil-to-Invertebrate Uptake Factor		Maximum Soil Invertebrate Tissue EPC (mg/kg_{dw})	Soil-to-Plant Uptake Factor		Maximum Terrestrial Plant Tissue EPC (mg/kg_{dw})
Inorganics							
ARSENIC	4.4	Eco-SSL regression	[b]	0.69	0.03752	[d]	0.16
CADMIUM	12.0	Eco-SSL regression	[b]	59.7	Eco-SSL regression	[d]	2.42
CHROMIUM, TOTAL	36.4	0.306	[b]	11.1	0.041	[d]	1.49
COPPER	116	0.515	[b]	59.7	Eco-SSL regression	[d]	12.7
LEAD	383	Eco-SSL regression	[b]	97.7	Eco-SSL regression	[d]	7.5
MERCURY	2.1	1.693	[c]	3.6	0.663	[e]	1.4
NICKEL	67.7	1.059	[c]	71.7	Eco-SSL regression	[d]	2.5
SELENIUM	0.46	Eco-SSL regression	[b]	0.53	Eco-SSL regression	[d]	0.22
SILVER	11.5	2.045	[b]	23.5	0.014	[d]	0.16
ZINC	425	Eco-SSL regression	[b]	623	Eco-SSL regression	[d]	138.1
Organics							
TOTAL HMW PAHs	4.4	2.6	[b]	11.4	Eco-SSL regression	[d]	0.74
TOTAL LMW PAHs	0.49	3.04	[b]	1.5	Eco-SSL regression	[d]	0.193
TOTAL PCB AROCLORS	0.48	6.667	[c]	3.2	0.106	[e,f]	0.0509

Notes:
Maximum EPCs for screening level evaluation represent maximum detected concentrations.

COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HMW - High Molecular Weight.
LMW - Low Molecular Weight.
PAHs - Polycyclic Aromatic Hydrocarbons.
PCBs - Polychlorinated Biphenyls.
USEPA - United States Environmental Protection Agency.

[a] Value presented is the maximum detected surface soil concentration in the On-Project Blue Beach area. Total PCB results are associated with soil samples collected from three decision units (DUs) using an incremental sampling methodology (ISM). The highest of the DU-specific 95% upper confidence limits was selected for use as it is higher than the maximum detect (Attachment C).
[b] Soil-to-invertebrate uptake factors and regression equations recommended by USEPA in development of Ecological Soil Screening Levels (USEPA, 2007a)

arsenic	ln(tissue concentration) = 0.706 * ln(soil concentration) - 1.421
cadmium	ln(tissue concentration) = 0.795 * ln(soil concentration) + 2.114
lead	ln(tissue concentration) = 0.807 * ln(soil concentration) - 0.218
selenium	ln(tissue concentration) = 0.733 * ln(soil concentration) - 0.075
zinc	ln(tissue concentration) = 0.328 * ln(soil concentration) + 4.449

[c] Soil-to-earthworm uptake factors from Sample, et al (1998) - median value from Table 11.
[d] Soil-to-plant uptake factors and regression equations recommended by USEPA in development of Ecological Soil Screening Levels (USEPA, 2007a)

cadmium	ln(tissue concentration) = 0.546 * ln(soil concentration) - 0.475
copper	ln(tissue concentration) = 0.394 * ln(soil concentration) + 0.668
lead	ln(tissue concentration) = 0.561 * ln(soil concentration) - 1.328
nickel	ln(tissue concentration) = 0.748 * ln(soil concentration) - 2.223
selenium	ln(tissue concentration) = 1.104 * ln(soil concentration) - 0.677
zinc	ln(tissue concentration) = 0.554 * ln(soil concentration) + 1.575
Total LMW PAHs	ln(tissue concentration) = 0.4544 * ln(soil concentration) - 1.3205
Total HMW PAHs	ln(tissue concentration) = 0.9469 * ln(soil concentration) - 1.7026

[e] Soil-to-plant uptake factor obtained from Los Alamos National Laboratory (LANL) EcoRisk database version 4.1 (LANL, 2017).
[f] Value for Aroclor 1254 used for Total PCBs.

ATTACHMENT G-1 TABLE 3

TOXICITY REFERENCE VALUES

ECOLOGICAL RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

COPC	TRV (mg/kg $_{bw}$/day)	Endpoint	Effect	Chronic/ Subchronic	Species	Primary Reference	Source of Reference
Inorganics							
ARSENIC	2.24	NOAEL	reproduction & growth	chronic	birds	USEPA, 2005a	
ARSENIC	1.04	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2005a	
CADMIUM	1.47	NOAEL	reproduction & growth	chronic	birds	USEPA, 2005b	
CADMIUM	0.77	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2005b	
CHROMIUM, TOTAL	2.66	NOAEL	reproduction & growth	chronic	birds	USEPA, 2008	
CHROMIUM, TOTAL	2.4	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2008	
COPPER	4.05	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007b	
COPPER	5.6	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007b	
LEAD	1.63	NOAEL	reproduction & growth	chronic	birds	USEPA, 2005c	
LEAD	4.7	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2005c	
MERCURY	0.0064	estimated NOAEL	reproductive	chronic	mallard duck	Heinz, 1979	Sample et al., 1996
MERCURY	0.032	NOAEL	reproductive	chronic	rat	Verschuuren et al., 1976	Sample et al., 1996
NICKEL	6.71	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007c	
NICKEL	1.7	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007c	
SELENIUM	0.29	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007d	
SELENIUM	0.143	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007d	
SILVER	2.02	NOAEL	reproduction & growth	chronic	birds	USEPA, 2006	
SILVER	6.02	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2006	
ZINC	75.4	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007e	
ZINC	66.1	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007e	
Organics							
TOTAL HMW PAHs	0.615	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007f	
TOTAL LMW PAHs	65.6	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007f	
TOTAL LMW PAHs / HMW PAHs	2	NOAEL	systemic	chronic	nestling/starlings	Trust et al., 1994 [a]	
TOTAL PCBs	0.068	estimated NOAEL	reproduction	chronic	mouse	McCoy et al., 1995 [b]	Sample et al., 1996
TOTAL PCBs	0.18	estimated NOAEL	reproduction	chronic	pheasant	Dahlgren et al., 1972 [b]	Sample et al., 1996

Notes:
LOAEL values from USEPA Eco-SSL documents were calculated as the geometric mean of growth and reproduction LOAEL values.
NOAELs were estimated if a NOAEL was not identified in the literature. The LOAEL was divided by 10 to derive an estimated NOAEL.

COPC - Chemical of Potential Concern.
HMW - High Molecular Weight.
LMW - Low Molecular Weight.
NOAEL - No Observed Adverse Effects Level.
PAHs - Polycyclic Aromatic Hydrocarbons.
PCBs - Polychlorinated Biphenyls.
TRV - Toxicological Reference Value

[a] The avian TRVs for the HMW and LMW PAHs are based on 7,12-dimethylbenz(a)anthracene.
[b] TRVs for Total PCBs are based on Aroclor 1254.

ATTACHMENT G-1 TABLE 4
POTENTIAL RISKS TO THE BOBWHITE QUAIL IN THE ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE BOBWHITE QUAIL	
Average Body Weight (kg)	0.175
Exposure Duration	1
Area Use Factor	1
Soil Consumption Rate (kg_{dw}/day)	0.000535
Terrestrial Plant Consumption Rate (kg_{dw}/day)	0.0088

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.

Total Daily Dose = $\frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations		Potential Daily Dose (mg/kg_{BW}/day)				
COPC	Soil (mg/kg_{dw})	Terrestrial Plant (mg/kg_{dw})	Soil	Terrestrial Plant	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics							
ARSENIC	4.4E+00	1.6E-01	1.3E-02	8.3E-03	2.2E-02	2.2E+00	9.7E-03
CADMIUM	1.2E+01	2.4E+00	3.7E-02	1.2E-01	1.6E-01	1.5E+00	1.1E-01
CHROMIUM, TOTAL	3.6E+01	1.5E+00	1.1E-01	7.5E-02	1.9E-01	2.7E+00	7.0E-02
COPPER	1.2E+02	1.3E+01	3.5E-01	6.4E-01	9.9E-01	4.1E+00	2.4E-01
LEAD	3.8E+02	7.5E+00	1.2E+00	3.7E-01	1.5E+00	1.6E+00	9.5E-01
MERCURY	2.1E+00	1.4E+00	6.5E-03	7.1E-02	7.8E-02	6.4E-03	**1.2E+01**
NICKEL	6.8E+01	2.5E+00	2.1E-01	1.3E-01	3.3E-01	6.7E+00	5.0E-02
SELENIUM	4.6E-01	2.2E-01	1.4E-03	1.1E-02	1.2E-02	2.9E-01	4.2E-02
SILVER	1.2E+01	1.6E-01	3.5E-02	8.1E-03	4.3E-02	2.0E+00	2.1E-02
ZINC	4.3E+02	1.4E+02	1.3E+00	6.9E+00	8.2E+00	6.6E+01	1.2E-01
Organics							
TOTAL HMW PAHs	4.4E+00	7.4E-01	1.3E-02	3.7E-02	5.1E-02	2.0E+00	2.5E-02
TOTAL LMW PAHs	4.9E-01	1.9E-01	1.5E-03	9.7E-03	1.1E-02	2.0E+00	5.6E-03
TOTAL PCB AROCLORS	4.8E-01	5.1E-02	1.5E-03	2.5E-03	4.0E-03	1.8E-01	2.2E-02

ATTACHMENT G-1 TABLE 5
POTENTIAL RISKS TO THE AMERICAN ROBIN IN THE ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE AMERICAN ROBIN	
Average Body Weight (kg)	0.080
Exposure Duration	1
Area Use Factor	1
Soil Consumption Rate (kg_{dw}/day)	0.000762
Soil Invertebrate Consumption Rate (kg_{dw}/day)	0.0119

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM DETECTED CONCENTRATIONS	Media Concentrations		Potential Daily Dose (mg/kg_{BW}/day)				
COPC	Soil (mg/kg_{dw})	Soil Invertebrate (mg/kg_{dw})	Soil	Soil Invertebrate	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics							
ARSENIC	4.4E+00	6.9E-01	4.2E-02	1.0E-01	1.4E-01	2.2E+00	6.4E-02
CADMIUM	1.2E+01	6.0E+01	1.1E-01	8.8E+00	9.0E+00	1.5E+00	**6.1E+00**
CHROMIUM, TOTAL	3.6E+01	1.1E+01	3.4E-01	1.6E+00	2.0E+00	2.7E+00	7.5E-01
COPPER	1.2E+02	6.0E+01	1.1E+00	8.8E+00	9.9E+00	4.1E+00	**2.5E+00**
LEAD	3.8E+02	9.8E+01	3.6E+00	1.4E+01	1.8E+01	1.6E+00	**1.1E+01**
MERCURY	2.1E+00	3.6E+00	2.0E-02	5.4E-01	5.6E-01	6.4E-03	**8.7E+01**
NICKEL	6.8E+01	7.2E+01	6.4E-01	1.1E+01	1.1E+01	6.7E+00	**1.7E+00**
SELENIUM	4.6E-01	5.3E-01	4.4E-03	7.8E-02	8.2E-02	2.9E-01	2.8E-01
SILVER	1.2E+01	2.4E+01	1.1E-01	3.5E+00	3.6E+00	2.0E+00	**1.8E+00**
ZINC	4.3E+02	6.2E+02	4.0E+00	9.2E+01	9.6E+01	6.6E+01	**1.5E+00**
Organics							
TOTAL HMW PAHs	4.4E+00	1.1E+01	4.2E-02	1.7E+00	1.7E+00	2.0E+00	8.7E-01
TOTAL LMW PAHs	4.9E-01	1.5E+00	4.6E-03	2.2E-01	2.3E-01	2.0E+00	1.1E-01
TOTAL PCB AROCLORS	4.8E-01	3.2E+00	4.5E-03	4.7E-01	4.8E-01	1.8E-01	**2.7E+00**

ATTACHMENT G-1 TABLE 6
POTENTIAL RISKS TO THE MEADOW VOLE IN THE ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE MEADOW VOLE	
Average Body Weight (kg)	0.033
Exposure Duration	1
Area Use Factor	1
Soil Consumption Rate (kg_{dw}/day)	0.000093
Terrestrial Plant Consumption Rate (kg_{dw}/day)	0.0077

Total Daily Dose = $\frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM DETECTED CONCENTRATIONS	Media Concentrations		Potential Daily Dose (mg/kg_{BW}/day)				
COPC	Soil (mg/kg_{dw})	Terrestrial Plant (mg/kg_{dw})	Soil	Terrestrial Plant	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics							
ARSENIC	4.4E+00	1.6E-01	1.2E-02	3.9E-02	5.1E-02	1.0E+00	4.9E-02
CADMIUM	1.2E+01	2.4E+00	3.4E-02	5.7E-01	6.0E-01	7.7E-01	7.8E-01
CHROMIUM, TOTAL	3.6E+01	1.5E+00	1.0E-01	3.5E-01	4.5E-01	2.4E+00	1.9E-01
COPPER	1.2E+02	1.3E+01	3.3E-01	3.0E+00	3.3E+00	5.6E+00	5.9E-01
LEAD	3.8E+02	7.5E+00	1.1E+00	1.7E+00	2.8E+00	4.7E+00	6.0E-01
MERCURY	2.1E+00	1.4E+00	6.0E-03	3.3E-01	3.4E-01	3.2E-02	**1.1E+01**
NICKEL	6.8E+01	2.5E+00	1.9E-01	5.9E-01	7.8E-01	1.7E+00	4.6E-01
SELENIUM	4.6E-01	2.2E-01	1.3E-03	5.0E-02	5.2E-02	1.4E-01	3.6E-01
SILVER	1.2E+01	1.6E-01	3.2E-02	3.8E-02	7.0E-02	6.0E+00	1.2E-02
ZINC	4.3E+02	1.4E+02	1.2E+00	3.2E+01	3.3E+01	7.5E+01	4.4E-01
Organics							
TOTAL HMW PAHs	4.4E+00	7.4E-01	1.2E-02	1.7E-01	1.9E-01	6.2E-01	3.0E-01
TOTAL LMW PAHs	4.9E-01	1.9E-01	1.4E-03	4.5E-02	4.7E-02	6.6E+01	7.1E-04
TOTAL PCB AROCLORS	4.8E-01	5.1E-02	1.3E-03	1.2E-02	1.3E-02	6.8E-02	1.9E-01

ATTACHMENT G-1 TABLE 7
POTENTIAL RISKS TO THE MEADOW VOLE IN THE ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE RACCOON	
Average Body Weight (kg)	5.780
Exposure Duration	1
Area Use Factor	1
Soil Consumption Rate (kg_{dw}/day)	0.0144
Terrestrial Plant Consumption Rate (kg_{dw}/day)	0.0645
Soil Invertebrate Consumption Rate (kg_{dw}/day)	0.0890

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM DETECTED CONCENTRATIONS	Media Concentrations			Potential Daily Dose (mg/kg_{BW}/day)					
COPC	Soil (mg/kg_{dw})	Soil Invertebrate (mg/kg_{dw})	Terrestrial Plant (mg/kg_{dw})	Soil	Soil Invertebrate	Terrestrial Plant	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics									
ARSENIC	4.4E+00	6.9E-01	1.6E-01	1.1E-02	1.1E-02	1.8E-03	2.3E-02	1.0E+00	2.2E-02
CADMIUM	1.2E+01	6.0E+01	2.4E+00	3.0E-02	9.2E-01	2.7E-02	9.8E-01	7.7E-01	**1.3E+00**
CHROMIUM, TOTAL	3.6E+01	1.1E+01	1.5E+00	9.1E-02	1.7E-01	1.7E-02	2.8E-01	2.4E+00	1.2E-01
COPPER	1.2E+02	6.0E+01	1.3E+01	2.9E-01	9.2E-01	1.4E-01	1.4E+00	5.6E+00	2.4E-01
LEAD	3.8E+02	9.8E+01	7.5E+00	9.6E-01	1.5E+00	8.3E-02	2.5E+00	4.7E+00	5.4E-01
MERCURY	2.1E+00	3.6E+00	1.4E+00	5.3E-03	5.6E-02	1.6E-02	7.7E-02	3.2E-02	**2.4E+00**
NICKEL	6.8E+01	7.2E+01	2.5E+00	1.7E-01	1.1E+00	2.8E-02	1.3E+00	1.7E+00	7.7E-01
SELENIUM	4.6E-01	5.3E-01	2.2E-01	1.1E-03	8.1E-03	2.4E-03	1.2E-02	1.4E-01	8.1E-02
SILVER	1.2E+01	2.4E+01	1.6E-01	2.9E-02	3.6E-01	1.8E-03	3.9E-01	6.0E+00	6.5E-02
ZINC	4.3E+02	6.2E+02	1.4E+02	1.1E+00	9.6E+00	1.5E+00	1.2E+01	7.5E+01	1.6E-01
Organics									
TOTAL HMW PAHs	4.4E+00	1.1E+01	7.4E-01	1.1E-02	1.8E-01	8.3E-03	2.0E-01	6.2E-01	3.2E-01
TOTAL LMW PAHs	4.9E-01	1.5E+00	1.9E-01	1.2E-03	2.3E-02	2.2E-03	2.6E-02	6.6E+01	4.0E-04
TOTAL PCB AROCLORS	4.8E-01	3.2E+00	5.1E-02	1.2E-03	4.9E-02	5.7E-04	5.1E-02	6.8E-02	7.5E-01

ATTACHMENT G-1 TABLE 8
POTENTIAL RISKS TO THE SHORT-TAILED SHREW IN THE ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE SHORT-TAILED SHREW	
Average Body Weight (kg)	0.016
Exposure Duration	1
Area Use Factor	1
Soil Consumption Rate (kg_{dw}/day)	0.000019
Soil Invertebrate Consumption Rate (kg_{dw}/day)	0.0021

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM DETECTED CONCENTRATIONS	Media Concentrations		Potential Daily Dose (mg/kg_{BW}/day)				
COPC	Soil (mg/kg_{dw})	Soil Invertebrate (mg/kg_{dw})	Soil	Soil Invertebrate	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics							
ARSENIC	4.4E+00	6.9E-01	5.2E-03	9.0E-02	9.5E-02	1.0E+00	9.1E-02
CADMIUM	1.2E+01	6.0E+01	1.4E-02	7.8E+00	7.8E+00	7.7E-01	**1.0E+01**
CHROMIUM, TOTAL	3.6E+01	1.1E+01	4.3E-02	1.5E+00	1.5E+00	2.4E+00	6.2E-01
COPPER	1.2E+02	6.0E+01	1.4E-01	7.8E+00	7.9E+00	5.6E+00	**1.4E+00**
LEAD	3.8E+02	9.8E+01	4.5E-01	1.3E+01	1.3E+01	4.7E+00	**2.8E+00**
MERCURY	2.1E+00	3.6E+00	2.5E-03	4.7E-01	4.8E-01	3.2E-02	**1.5E+01**
NICKEL	6.8E+01	7.2E+01	7.9E-02	9.4E+00	9.4E+00	1.7E+00	**5.5E+00**
SELENIUM	4.6E-01	5.3E-01	5.4E-04	6.9E-02	6.9E-02	1.4E-01	4.8E-01
SILVER	1.2E+01	2.4E+01	1.4E-02	3.1E+00	3.1E+00	6.0E+00	5.1E-01
ZINC	4.3E+02	6.2E+02	5.0E-01	8.1E+01	8.2E+01	7.5E+01	**1.1E+00**
Organics							
TOTAL HMW PAHs	4.4E+00	1.1E+01	5.2E-03	1.5E+00	1.5E+00	6.2E-01	**2.4E+00**
TOTAL LMW PAHs	4.9E-01	1.5E+00	5.8E-04	1.9E-01	1.9E-01	6.6E+01	3.0E-03
TOTAL PCB AROCLORS	4.8E-01	3.2E+00	5.6E-04	4.2E-01	4.2E-01	6.8E-02	**6.1E+00**

ATTACHMENT G-1 TABLE 9
SUMMARY OF SCREENING LEVEL FOOD WEB HQs IN THE ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	NOAEL-based HQs - Maximum Concentrations				
COPC	**Bobwhite Quail**	**American Robin**	**Meadow Vole**	**Raccoon**	**Short-tailed Shrew**
Inorganics					
ARSENIC	9.7E-03	6.4E-02	4.9E-02	2.2E-02	9.1E-02
CADMIUM	1.1E-01	**6.1E+00**	7.8E-01	**1.3E+00**	**1.0E+01**
CHROMIUM, TOTAL	7.0E-02	7.5E-01	1.9E-01	1.2E-01	6.2E-01
COPPER	2.4E-01	**2.5E+00**	5.9E-01	2.4E-01	**1.4E+00**
LEAD	9.5E-01	**1.1E+01**	6.0E-01	5.4E-01	**2.8E+00**
MERCURY	**1.2E+01**	**8.7E+01**	**1.1E+01**	**2.4E+00**	**1.5E+01**
NICKEL	5.0E-02	**1.7E+00**	4.6E-01	7.7E-01	**5.5E+00**
SELENIUM	4.2E-02	2.8E-01	3.6E-01	8.1E-02	4.8E-01
SILVER	2.1E-02	**1.8E+00**	1.2E-02	6.5E-02	5.1E-01
ZINC	1.2E-01	**1.5E+00**	4.4E-01	1.6E-01	**1.1E+00**
Organics					
TOTAL HMW PAHs	2.5E-02	8.7E-01	3.0E-01	3.2E-01	**2.4E+00**
TOTAL LMW PAHs	5.6E-03	1.1E-01	7.1E-04	4.0E-04	3.0E-03
TOTAL PCB AROCLORS	2.2E-02	**2.7E+00**	1.9E-01	7.5E-01	**6.1E+00**

Notes:
Maximum EPCs for screening level evaluation represent maximum detected concentrations. Total PCB results are associated with soil samples collected from three sampling units (SUs) using an incremental sampling methodology (ISM). The highest of the SU-specific 95% upper confidence limits was selected for use as it is higher than the maximum detect (Attachment C).
Potential risk is calculated using the maximum detected concentrations and NOAEL-based TRVs.
HQs above 1 are bolded and highlighted.

COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
HMW - High Molecular Weight.
HQ - Hazard Quotient (Dose/TRV).
LMW - Low Molecular Weight.
NOAEL - No Observed Adverse Effect Level.
PAHs - Polycyclic Aromatic Hydrocarbons.
PCBs - Polychlorinated Biphenyls.
TRV - Toxicity Reference Value.

ATTACHMENT G-1 TABLE 10
REFERENCES CITED FOR THE ON-PROJECT BLUE BEACH AREA FOOD WEB MODEL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

U.S. Environmental Protection Agency (USEPA). 2007a. Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs). Attachment 4-1 Exposure Factors and Bioaccumulation Models for Derivation of Wildlife Eco-SSLs. OSWER Directive 9285.7-55. Revised April.
U.S. Environmental Protection Agency (USEPA). 2007b. Ecological Soil Screening Level for Copper, Interim Final. Office of Emergency and Remedial Response. OSWER Directive 9285.7-68. February.
U.S. Environmental Protection Agency (USEPA). 2007c. Ecological Soil Screening Level for Nickel, Interim Final. Office of Emergency and Remedial Response. OSWER Directive 9285.7-76. March.
U.S. Environmental Protection Agency (USEPA). 2007d. Ecological Soil Screening Level for Selenium, Interim Final. Office of Emergency and Remedial Response. OSWER Directive 9285.7-72. November.
U.S. Environmental Protection Agency (USEPA). 2007e. Ecological Soil Screening Level for Zinc, Interim Final. Office of Emergency and Remedial Response. OSWER Directive 9285.7-73. November.
U.S. Environmental Protection Agency (USEPA). 2007f. Ecological Soil Screening Level for PAHs, Interim Final. Office of Emergency and Remedial Response. OSWER Directive 9285.7-78. June.

Attachment G-2

Screening Food Web Model – Off-Project Red Maple Swamp/Tidal Stream Area

ATTACHMENT G-2
SCREENING LEVEL FOOD WEB MODEL - OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
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NORTH KINGSTOWN, RHODE ISLAND

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ATTACHMENT G-2 TABLE 1
EXPOSURE PARAMETERS FOR WILDLIFE RECEPTORS IN OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Receptor Species	Body Weight (kg)	Food Ingestion Rate (kg_{dw}/day)	Dietary Assumptions (% kg_{dw}/day)		Incidental Sediment Ingestion (% kg_{dw}/day)	Average Home Range (acres)
			Wetland Invertebrates	Wetland Plants		
Birds						
Marsh Wren *(Cistothorus palustris)*	0.0106 [a]	0.0029 [b]	100% 0.0029	-- --	0.9% [d] 0.000026	0.295 [e]
Mammals						
Raccoon *(Procyon lotor)*	5.78 [a]	0.1535 [b]	58% [c] 0.0890	42% [c] 0.0645	9.4% [d] 0.014	1558 [e]
Meadow vole *(Microtus pennsylvanicus)*	0.033 [a]	0.0077 [b]	-- --	100% [c] 0.0077	1.2% [d] 0.000093	0.066 [e]
Short-tailed shrew *(Blarina brevicauda)*	0.0161 [a]	0.0021 [b]	100% [c] 0.0021	-- --	0.9% [d] 0.000019	0.96 [e]

General Notes:

BW - Body Weight g - grams

DW - Dry Weight kg - kilograms

FIR - Food Ingestion Rate

Notes for Marsh Wren

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for insectivorous birds developed by Nagy, 2001 [FIR (g_{dw}/day) = 0.540*$BW^{0.705}$] using average body weight.

[c] Diet assumed to be exclusively benthic invertebrates.

[d] In the absence of data for the wren, the incidental soil ingestion rate is based on 50th percentile value for shrew (consuming 100% earthworms; USEPA, 2007a).

[e] Home range for freshwater wetlands listed by USEPA (1993) ranges from 0.17 to 0.42 acres with an average of 0.295 acres.

Notes for Raccoon

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for omnivorous mammals developed by Nagy, 2001 [FIR (g_{dw}/day) = 0.432*$BW^{0.678}$] using average body weight.

[c] Diet composition based on the average of seasonal diets for raccoon in a Maryland forested bottomland (USEPA, 1993). Amphibian component of diet (12%) added to benthic invertebrate component.

[d] The incidental soil ingestion rate is based on the value identified by Beyer (1994) for raccoons.

[e] Home range listed by USEPA (1993) ranges from 96 to 6325 acres with an average of 1558 acres.

Meadow vole

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for herbivorous mammals developed by Nagy, 2001 [FIR (kg_{dw}/day) = 0.859*$BW^{0.628}$] using average body weight.

[c] Diet is expected to be composed entirely of plants.

[d] The incidental soil ingestion rate is based on 50th percentile value for vole (USEPA, 2007a).

[e] Home range listed by USEPA (1993) ranges from 0.000494 to 0.2051 acres with an average of 0.0659 acres.

Notes for Short-tailed Shrew

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for insectivorous mammals developed by Nagy, 2001 [FIR (kg_{dw}/day) = 0.373*$BW^{0.622}$] using average body weight.

[c] An exclusive soil invertebrate diet was selected.

[d] The incidental soil ingestion rate is based on 50th percentile value for shrew (USEPA, 2007a).

[e] Average home range for short-tailed shrew in Michigan, Manitoba, and New York (USEPA, 1993).

ATTACHMENT G-2 TABLE 2

MEDIA AND TISSUE CONCENTRATIONS IN OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	Measured Media Concentrations [a]	**Estimated Wetland Invertebrate Tissue**			**Estimated Plant Tissue**		
COPC	Maximum Detected Soil / Hydric Soil / Tidal Stream Sediment Concentration (mg/kg_{dw})	Sediment-to-Invertebrate Uptake Factor		Maximum Wetland Invertebrate Tissue EPC (mg/kg_{dw})	Soil-to-Plant Uptake Factor		Maximum Wetland Plant Tissue EPC (mg/kg_{dw})
Inorganics							
ARSENIC	26.4	0.143	[b]	3.8	0.0375	[e]	0.99
CADMIUM	2.9	0.60	[b]	1.7	Eco-SSL regression	[e]	1.1
CHROMIUM, TOTAL	44.4	0.10	[b]	4.4	0.041	[e]	1.8
COPPER	75.3	1.556	[b]	117.2	Eco-SSL regression	[e]	10.7
LEAD	584	0.071	[b]	41.5	Eco-SSL regression	[e]	9.4
MERCURY	0.29	1.1	[b]	0.33	0.663	[f]	0.19
NICKEL	33.2	0.486	[b]	16.1	Eco-SSL regression	[e]	1.5
SELENIUM	6.2	1.0	[d]	6.1	Eco-SSL regression	[e]	3.8
SILVER	0.84	2.04	[d]	1.7	0.014	[e]	0.012
ZINC	330	1.936	[b]	639	Eco-SSL regression	[e]	120
Organics							
TOTAL HMW PAHs	37.0	0.071	[c]	0.390	Eco-SSL regression	[e]	1.4
TOTAL LMW PAHs	4.4	0.12	[c]	0.079	Eco-SSL regression	[e]	0.74
TOTAL PCB AROCLORS	2.3	0.72	[c]	2.4	0.106	[f, g]	0.24

Notes:
Maximum EPCs for screening level evaluation represent maximum detected concentrations.

COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HMW - High Molecular Weight.
LMW - Low Molecular Weight.
PAHs - Polycyclic Aromatic Hydrocarbons.
PCBs - Polychlorinated Biphenyls.
USEPA - United States Environmental Protection Agency.

[a] Value presented is the maximum detected concentration from the following off-Project datasets:
surface soil from the off-Project Red Maple Swamp walking path, hydric surface soil from the off-Project Red Maple Swamp, and surface sediment from the off-Project tidal stream.
[b] Benthic invertebrate uptake factors obtained from Bechtel Jacobs (1998; Table 2; all data). Value selected is median uptake factor for depurated and non-depurated invertebrates combined expressed on a dry weight basis.

Invertebrate tissue $_{dw}$ = (uptake factor x sediment concentration)

[c] Median biota-sediment accumulation factor (BSAF) and lipids content for benthic invertebrates obtained from BSAF Data Set available at http://www.epa.gov/med/Prods_Pubs/bsaf.htm. See Table 3 for data.

Median lipid values from supporting studies and median site-specific sediment organic carbon used to determine tissue levels.

Median lipid levels for benthic invertebrates were -
0.424% (0.00424 fraction lipids) for HMW PAHs
0.415% (0.00415 fraction lipids) for LMW PAHs
4.2% (0.042 fraction lipids) for PCBs

Median site-specific TOC is 13% (0.13 fraction organic carbon) based on samples collected from 20 locations in 2011 and 2019 (see Attachment A for data).

Invertebrate tissue $_{dw}$ = [BSAF x sediment concentration x (fraction lipid/fraction organic carbon)]/(1-% moisture)

[d] Sediment-to-invertebrate factors obtained from Los Alamos National Laboratory (LANL) EcoRisk database version 4.1 (LANL, 2017).

Invertebrate tissue $_{dw}$ = (uptake factor x sediment concentration)

[e] Soil-to-plant uptake factors and regression equations recommended by USEPA in development of Ecological Soil Screening Levels (USEPA, 2007a)

cadmium	ln(tissue concentration) = 0.546 * ln(soil concentration) - 0.475
copper	ln(tissue concentration) = 0.394 * ln(soil concentration) + 0.668
lead	ln(tissue concentration) = 0.561 * ln(soil concentration) - 1.328
nickel	ln(tissue concentration) = 0.748 * ln(soil concentration) - 2.223
selenium	ln(tissue concentration) = 1.104 * ln(soil concentration) - 0.677
zinc	ln(tissue concentration) = 0.554 * ln(soil concentration) + 1.575
Total LMW PAHs	ln(tissue concentration) = 0.4544 * ln(soil concentration) - 1.3205
Total HMW PAHs	ln(tissue concentration) = 0.9469 * ln(soil concentration) - 1.7026

[f] Soil-to-plant uptake factor obtained from Los Alamos National Laboratory (LANL) EcoRisk database version 4.1 (LANL, 2017).
[g] Value for Aroclor 1254 used for Total PCBs.

ATTACHMENT G-2 TABLE 3
BSAFs FOR ORGANIC COMPOUNDS
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Site ID	Superfund Site	Organism Common Name	Organism Latin Name	Biota Tissue Supplemental	Chemical	BSAF	Lipid content (fraction)
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	benzo(a)anthracene	1.327473577	0.00685
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(a)anthracene	0.453227799	0.0181
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	benzo(a)anthracene	11.77845287	0.0041
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(a)anthracene	5.071601211	0.0077
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(a)anthracene	3.176769121	0.0083
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.375233472	0.003875
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.180182142	0.00569
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.558957856	0.00679
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.20631144	0.00878
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)anthracene	0.644749942	0.00254
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)anthracene	0.236957821	0.0035
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)anthracene	0.374014199	0.00285
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)anthracene	0.394990554	0.00352
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)anthracene	0.058812517	0.00109
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	1.348642897	0.00692
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)anthracene	1.702772323	0.00287
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)anthracene	1.952611774	0.00278
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.088685086	0.00636
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)anthracene	0.433182677	0.00181
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)anthracene	0.770021159	0.00031
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)anthracene	0.315173217	0.00415
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.025204237	0.00893
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)anthracene	1.142812259	0.00259
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.063332959	0.00657
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)anthracene	0.099218065	0.00471
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)anthracene	0.693766911	0.00081
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)anthracene	0.016011435	0.002515
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)anthracene	0.011521518	0.00227
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)anthracene	0.038572897	0.00093
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)anthracene	0.05486001	0.002205
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)anthracene	0.023413002	0.00127
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)anthracene	0.033606054	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)anthracene	0.021734787	0.00162
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)anthracene	0.186032422	0.00126
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.200180982	0.00098
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.360811741	0.0047675
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	single or multiple organisms	benzo(a)anthracene	0.002020781	0.039
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.530102038	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.081125729	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.126756468	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.07388855	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)anthracene	0.210447094	0.00146
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	benzo(a)anthracene	0.000927519	0.016
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	benzo(a)anthracene	0.011465769	0.015
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)anthracene	0.028847963	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)anthracene	0.00605466	0.00607
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)anthracene	0.036538916	0.00367
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)anthracene	0.005550202	0.00454
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	benzo(a)anthracene	0.030779865	0.00355
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)anthracene	0.038565971	0.00384
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	benzo(a)anthracene	0.030043404	0.00479
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)anthracene	0.008673718	0.00504
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	benzo(a)anthracene	0.010816021	0.00554
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)anthracene	0.031425936	0.00488
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)anthracene	0.000787617	0.00922
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)anthracene	0.007596034	0.00424
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)anthracene	0.000597282	0.01121
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)anthracene	0.004447148	0.0029
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)anthracene	0.000818758	0.00642
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)anthracene	0.032526099	0.00819
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)anthracene	0.000135038	0.01323
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)anthracene	0.116890947	0.00898
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)anthracene	0.000147496	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)anthracene	0.003649449	0.01232
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)anthracene	0.019742008	0.0039
PORT01	Portland Harbor	clam (Macoma nasuta)	Macoma nasuta	no shell	benzo(a)anthracene	0.102814961	0.008366633
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(a)pyrene	4.701073596	0.0077
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	benzo(a)pyrene	1.266011124	0.00685
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(a)pyrene	0.431672413	0.0181
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	benzo(a)pyrene	9.511977469	0.0041
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(a)pyrene	3.579161792	0.0083
CALC01	Calcasieu Estuary	eastern oyster	Crassostrea virginica	single or multiple organisms	benzo(a)pyrene	0.105084803	0.015
CALC01	Calcasieu Estuary	ribbed mussel	Geukensia demissa	single or multiple organisms	benzo(a)pyrene	0.019546332	0.016
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.123683972	0.003875
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.066207151	0.00569
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.351277632	0.00679
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.045327457	0.00878
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)pyrene	0.145546355	0.00254
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)pyrene	0.093003905	0.0035
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)pyrene	0.173628623	0.00285
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)pyrene	0.131286448	0.00352
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)pyrene	0.02981786	0.00109
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)pyrene	0.503459057	0.00287
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)pyrene	0.976436272	0.00278
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.025479434	0.00636
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)pyrene	0.146734686	0.00181
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)pyrene	0.280751495	0.00031
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)pyrene	0.132727194	0.00415
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.004699959	0.00893
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)pyrene	0.222951904	0.0033
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)pyrene	0.355170727	0.00259
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.022449746	0.00657
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)pyrene	0.028380607	0.00471
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)pyrene	0.150339621	0.00081
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)pyrene	0.010066621	0.002515
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(a)pyrene	0.062083685	0.00093
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)pyrene	0.025423236	0.002205
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)pyrene	0.020351302	0.00127
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)pyrene	0.029832323	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)pyrene	0.023636744	0.00162
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(a)pyrene	0.042172799	0.00126
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.031296731	0.00098
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.074104867	0.0047675
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.238326123	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.008364246	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.031478496	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.019100236	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(a)pyrene	0.043299848	0.00146
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	benzo(a)pyrene	0.008440321	0.015
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)pyrene	0.002839335	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)pyrene	0.007422636	0.00607
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)pyrene	0.025081311	0.00367
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)pyrene	0.002706769	0.00454
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	benzo(a)pyrene	0.016320353	0.00355
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	benzo(a)pyrene	0.016690634	0.00479
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)pyrene	0.024421166	0.00384
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)pyrene	0.005286548	0.00504
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	benzo(a)pyrene	0.006830465	0.00554
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)pyrene	0.015887609	0.00488
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)pyrene	0.000629549	0.00922
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)pyrene	0.005228232	0.00424
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)pyrene	0.000368314	0.01121
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)pyrene	0.002956976	0.0029
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)pyrene	0.000869863	0.00642
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)pyrene	0.016787587	0.00819
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)pyrene	0.000163462	0.01323

ATTACHMENT G-2 TABLE 3
BSAFs FOR ORGANIC COMPOUNDS
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Site ID	Superfund Site	Organism Common Name	Organism Latin Name	Biota Tissue Supplemental	Chemical	BSAF	Lipid content (fraction)
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)pyrene	0.049069201	0.00888
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)pyrene	0.000162546	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(a)pyrene	0.001704545	0.01232
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(a)pyrene	0.007178811	0.0039
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(b)fluoranthene	0.313594582	0.0077
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	benzo(b)fluoranthene	1.050848717	0.00685
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(b)fluoranthene	0.359772351	0.0181
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	benzo(b)fluoranthene	8.032881549	0.0041
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(b)fluoranthene	1.867941339	0.0083
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	single or multiple organisms	benzo(b)fluoranthene	0.001747388	0.039
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	benzo(b)fluoranthene	0.001437404	0.016
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	benzo(b)fluoranthene	0.01049293	0.015
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(g,h,i)perylene	6.2610888	0.0077
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	benzo(g,h,i)perylene	3.752260002	0.00685
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(g,h,i)perylene	1.277521935	0.0181
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	benzo(g,h,i)perylene	16.75742142	0.0041
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(g,h,i)perylene	6.150232408	0.0083
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(g,h,i)perylene	0.163395634	0.00254
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(g,h,i)perylene	0.050769747	0.003875
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(g,h,i)perylene	0.204243328	0.00679
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(g,h,i)perylene	0.032127595	0.00878
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(g,h,i)perylene	0.030264367	0.002515
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(g,h,i)perylene	0.4110079	0.00692
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(g,h,i)perylene	0.129590428	0.0035
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(g,h,i)perylene	0.139730413	0.00285
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(g,h,i)perylene	0.099105815	0.00352
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	benzo(g,h,i)perylene	0.033474596	0.00636
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(g,h,i)perylene	0.108705063	0.00181
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(g,h,i)perylene	0.41616365	0.00031
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(g,h,i)perylene	0.104254739	0.00415
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(g,h,i)perylene	0.113648804	0.0033
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	benzo(g,h,i)perylene	0.135354667	0.00093
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(g,h,i)perylene	0.066930741	0.00109
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(g,h,i)perylene	0.052638677	0.002205
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(g,h,i)perylene	0.061018015	0.00127
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(g,h,i)perylene	0.062206713	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(g,h,i)perylene	0.059483728	0.00162
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	benzo(g,h,i)perylene	0.037343357	0.00126
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(g,h,i)perylene	0.117038667	0.0047675
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(g,h,i)perylene	0.613995964	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(g,h,i)perylene	0.033115627	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(g,h,i)perylene	0.051780002	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(g,h,i)perylene	0.045240151	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(g,h,i)perylene	0.067666884	0.00146
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	benzo(g,h,i)perylene	0.082989044	0.00098
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	benzo(g,h,i)perylene	0.003069382	0.016
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	single or multiple organisms	benzo(g,h,i)perylene	0.003475784	0.039
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	benzo(g,h,i)perylene	0.015535871	0.015
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(g,h,i)perylene	0.003869004	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(g,h,i)perylene	0.01603751	0.00607
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(g,h,i)perylene	0.004793789	0.00454
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	benzo(g,h,i)perylene	0.016912965	0.00355
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	benzo(g,h,i)perylene	0.019271283	0.00479
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(g,h,i)perylene	0.042817102	0.00384
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(g,h,i)perylene	0.006036368	0.00504
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(g,h,i)perylene	0.01743397	0.00488
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(g,h,i)perylene	0.000764078	0.00922
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(g,h,i)perylene	0.008584005	0.00424
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(g,h,i)perylene	0.000797689	0.01121
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(g,h,i)perylene	0.001328737	0.00642
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(g,h,i)perylene	0.013498299	0.00819
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(g,h,i)perylene	0.000130835	0.01323
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(g,h,i)perylene	0.069804902	0.00888
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(g,h,i)perylene	0.000214236	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	benzo(g,h,i)perylene	0.003637796	0.01232
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(g,h,i)perylene	0.005357055	0.0029
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	benzo(g,h,i)perylene	0.006194176	0.0039
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	benzo(k)fluoranthene	1.127687213	0.00685
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	benzo(k)fluoranthene	0.38506549	0.0181
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	benzo(k)fluoranthene	11.02448629	0.0041
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	benzo(k)fluoranthene	0.002264765	0.016
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	single or multiple organisms	benzo(k)fluoranthene	0.002866044	0.039
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	benzo(k)fluoranthene	0.014767261	0.015
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	chrysene	0.33971217	0.0181
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	chrysene	3.402961982	0.0077
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	chrysene	7.303934398	0.0041
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	chrysene	0.907599087	0.0076
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	chrysene	1.631304729	0.0083
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	chrysene	0.993259758	0.00685
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	chrysene	0.229901043	0.00254
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	chrysene	0.2475404	0.003875
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	chrysene	0.294392736	0.00679
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	chrysene	0.196000656	0.00878
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	chrysene	0.174311721	0.00569
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	chrysene	0.139210183	0.0035
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	chrysene	0.030510219	0.002515
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	chrysene	0.258602966	0.00181
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	chrysene	0.381762514	0.00285
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	chrysene	0.16508225	0.00352
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	chrysene	1.326374653	0.00692
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	chrysene	0.561522731	0.00287
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	chrysene	0.771151658	0.00278
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	chrysene	0.091559483	0.00636
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	chrysene	0.484864184	0.00031
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	chrysene	0.200921689	0.00415
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	chrysene	0.015832184	0.00893
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	chrysene	0.577523929	0.00259
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	chrysene	0.061254854	0.00657
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	chrysene	0.083198585	0.00471
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	chrysene	0.412495568	0.00081
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	chrysene	0.170491905	0.00093
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	chrysene	0.144687574	0.00109
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	chrysene	0.117904391	0.002205
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	chrysene	0.085254635	0.00127
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	chrysene	0.098547869	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	chrysene	0.071233762	0.00162
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	chrysene	0.22761324	0.00126
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	chrysene	0.422958168	0.0047675
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	chrysene	0.301331411	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	chrysene	0.024519539	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	chrysene	0.142567719	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	chrysene	0.104957907	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	chrysene	0.408481878	0.00146
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	chrysene	0.171959747	0.00098
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	chrysene	0.007128122	0.015
PORT01	Portland Harbor	clam (Macoma nasuta)	Macoma nasuta	no shell	chrysene	0.050677492	0.008366633
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	dibenzo(a,h)anthracene	37.06895679	0.0041
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	dibenzo(a,h)anthracene	14.25745305	0.0077
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	dibenzo(a,h)anthracene	0.137156672	0.003875
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	dibenzo(a,h)anthracene	0.225378911	0.00679
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	dibenzo(a,h)anthracene	0.040286612	0.002515
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	dibenzo(a,h)anthracene	0.045943305	0.00093
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	dibenzo(a,h)anthracene	0.029074061	0.00109
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	dibenzo(a,h)anthracene	0.096094839	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	dibenzo(a,h)anthracene	0.051820727	0.00126
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	dibenzo(a,h)anthracene	0.16250795	0.0047675

ATTACHMENT G-2 TABLE 3
BSAFs FOR ORGANIC COMPOUNDS
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Site ID	Superfund Site	Organism Common Name	Organism Latin Name	Biota Tissue Supplemental	Chemical	BSAF	Lipid content (fraction)
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	dibenzo(a,h)anthracene	0.626016253	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	dibenzo(a,h)anthracene	0.023561119	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	dibenzo(a,h)anthracene	0.034011628	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	dibenzo(a,h)anthracene	0.035881567	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	dibenzo(a,h)anthracene	0.062660402	0.00146
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	dibenzo(a,h)anthracene	0.057868787	0.00098
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	dibenzo(a,h)anthracene	0.007332171	0.00607
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	dibenzo(a,h)anthracene	0.017487797	0.00479
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	dibenzo(a,h)anthracene	0.018142012	0.00384
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	dibenzo(a,h)anthracene	0.00840137	0.00488
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	dibenzo(a,h)anthracene	0.000166288	0.00922
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	dibenzo(a,h)anthracene	0.000347371	0.01121
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	dibenzo(a,h)anthracene	0.009634425	0.00819
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	dibenzo(a,h)anthracene	3.72818E-05	0.01323
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	dibenzo(a,h)anthracene	0.033479175	0.00888
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	dibenzo(a,h)anthracene	0.000260606	0.00642
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	dibenzo(a,h)anthracene	0.001610633	0.01232
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	dibenzo(a,h)anthracene	0.002641599	0.0039
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	fluoranthene	0.617507724	0.00685
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	fluoranthene	4.535855482	0.0041
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	fluoranthene	0.209484329	0.0181
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	fluoranthene	2.752574417	0.0077
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluoranthene	0.783385026	0.00878
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	fluoranthene	2.452103294	0.0083
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluoranthene	0.608945141	0.00254
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluoranthene	0.639988398	0.003875
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluoranthene	0.531172357	0.00679
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluoranthene	0.395464111	0.00569
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluoranthene	0.346182985	0.0035
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluoranthene	0.31863392	0.00285
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluoranthene	0.197796169	0.00636
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluoranthene	0.522482742	0.00181
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluoranthene	0.092472604	0.00471
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluoranthene	0.307224387	0.00081
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluoranthene	0.304954852	0.00352
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluoranthene	1.737346423	0.00692
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluoranthene	1.967241469	0.00287
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluoranthene	2.401303265	0.00278
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluoranthene	0.566897309	0.00031
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluoranthene	0.145545399	0.00415
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluoranthene	0.032273426	0.00893
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluoranthene	0.676006714	0.0033
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluoranthene	0.800410709	0.00259
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluoranthene	0.084186049	0.00657
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluoranthene	0.057017231	0.002515
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluoranthene	0.044134442	0.00227
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluoranthene	0.187663092	0.00093
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluoranthene	0.287847551	0.00109
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluoranthene	0.148235471	0.002205
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluoranthene	0.070890822	0.00127
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluoranthene	0.104637545	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluoranthene	0.060245522	0.00162
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluoranthene	0.232638537	0.00126
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	fluoranthene	0.001391076	0.016
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluoranthene	0.771169023	0.0047675
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluoranthene	1.385706905	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluoranthene	0.082493261	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluoranthene	0.205167213	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluoranthene	0.189874731	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluoranthene	0.408948441	0.00146
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluoranthene	0.496908393	0.00098
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	single or multiple organisms	fluoranthene	0.002889395	0.039
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	fluoranthene	0.009525915	0.015
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluoranthene	0.008536291	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluoranthene	0.073042707	0.00367
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluoranthene	0.017787964	0.00607
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluoranthene	0.013224154	0.00454
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	fluoranthene	0.047188586	0.00355
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	fluoranthene	0.042073895	0.00479
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluoranthene	0.07187453	0.00384
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluoranthene	0.036530522	0.00504
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	fluoranthene	0.034199239	0.00554
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluoranthene	0.084564785	0.00488
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluoranthene	0.00120909	0.00922
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluoranthene	0.016333244	0.00424
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluoranthene	0.001219058	0.01121
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluoranthene	0.071413886	0.00819
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluoranthene	0.000474136	0.01323
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluoranthene	0.272743801	0.00888
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluoranthene	0.00044074	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluoranthene	0.001894626	0.00642
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluoranthene	0.011579234	0.01232
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluoranthene	0.019902462	0.0029
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluoranthene	0.033201924	0.0039
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	fluoranthene	0.088772733	0.011
PORT01	Portland Harbor	clam (Macoma nasuta)	Macoma nasuta	no shell	fluoranthene	0.207720257	0.01
PORT01	Portland Harbor	clam (Macoma nasuta)	Macoma nasuta	no shell	fluoranthene	0.125237191	0.017
PORT01	Portland Harbor	clam (Macoma nasuta)	Macoma nasuta	no shell	fluoranthene	0.140819105	0.008366633
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	indeno(1,2,3-cd)pyrene	0.083862052	0.003875
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	indeno(1,2,3-cd)pyrene	19.55224893	0.0041
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	indeno(1,2,3-cd)pyrene	4.04464675	0.00685
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	indeno(1,2,3-cd)pyrene	1.374839897	0.0181
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	indeno(1,2,3-cd)pyrene	9.04415385	0.0077
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	indeno(1,2,3-cd)pyrene	11.40247384	0.0083
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	indeno(1,2,3-cd)pyrene	0.127582965	0.00254
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	indeno(1,2,3-cd)pyrene	0.160808954	0.00679
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	indeno(1,2,3-cd)pyrene	0.030307033	0.00878
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	indeno(1,2,3-cd)pyrene	0.110221719	0.0035
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	indeno(1,2,3-cd)pyrene	0.102816078	0.00285
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	indeno(1,2,3-cd)pyrene	0.021902292	0.00636
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	indeno(1,2,3-cd)pyrene	0.088934601	0.00181
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	indeno(1,2,3-cd)pyrene	0.073101551	0.00352
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	indeno(1,2,3-cd)pyrene	0.394164603	0.00692
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	indeno(1,2,3-cd)pyrene	0.087705677	0.00415
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	indeno(1,2,3-cd)pyrene	0.02198172	0.002515
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	indeno(1,2,3-cd)pyrene	0.032700823	0.00093
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	indeno(1,2,3-cd)pyrene	0.040719799	0.00109
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	indeno(1,2,3-cd)pyrene	0.027757013	0.002205
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	indeno(1,2,3-cd)pyrene	0.034392253	0.00127
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	indeno(1,2,3-cd)pyrene	0.035444819	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	indeno(1,2,3-cd)pyrene	0.037301588	0.00162
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	indeno(1,2,3-cd)pyrene	0.032244074	0.00126
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	indeno(1,2,3-cd)pyrene	0.112863535	0.0047675
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	indeno(1,2,3-cd)pyrene	0.663847351	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	indeno(1,2,3-cd)pyrene	0.017830001	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	indeno(1,2,3-cd)pyrene	0.042960526	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	indeno(1,2,3-cd)pyrene	0.031416055	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	indeno(1,2,3-cd)pyrene	0.054794522	0.00146
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	indeno(1,2,3-cd)pyrene	0.060413997	0.00098
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.001847264	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.011368716	0.00607
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.002303988	0.00454
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.020156096	0.00479
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.016649198	0.00355
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.035364583	0.00384
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.011835962	0.00488

ATTACHMENT G-2 TABLE 3
BSAFs FOR ORGANIC COMPOUNDS
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Site ID	Superfund Site	Organism Common Name	Organism Latin Name	Biota Tissue Supplemental	Chemical	BSAF	Lipid content (fraction)
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.000454761	0.00922
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.000659411	0.01121
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.012300812	0.00819
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	indeno(1,2,3-cd)pyrene	6.02912E-05	0.01323
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.066979586	0.00888
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.000111111	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.000735542	0.00642
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.00255468	0.01232
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	indeno(1,2,3-cd)pyrene	0.00594355	0.0039
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	pyrene	3.33151079	0.0041
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	pyrene	0.367460659	0.003875
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	pyrene	0.357536347	0.00685
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	pyrene	0.121405697	0.0181
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	pyrene	2.411835196	0.0077
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	pyrene	0.435344525	0.0076
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	pyrene	1.005930254	0.0083
CALC01	Calcasieu Estuary	penaeid shrimp	Penaeidae sp.	single or multiple organisms	pyrene	0.001246679	0.021
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	pyrene	0.391369853	0.00679
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	pyrene	0.227453675	0.00878
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	pyrene	0.199213564	0.00569
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	pyrene	0.06277416	0.00127
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	pyrene	0.317279158	0.00254
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	pyrene	0.237697558	0.0035
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	pyrene	0.276328905	0.00285
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	pyrene	0.267788567	0.00352
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	pyrene	1.457319563	0.00692
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	pyrene	1.647840548	0.00287
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	pyrene	2.131838663	0.00278
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	pyrene	0.115015983	0.00636
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	pyrene	0.348285571	0.00181
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	pyrene	0.456018411	0.00031
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	pyrene	0.130816129	0.00415
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	pyrene	0.016330093	0.00893
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	pyrene	0.493363199	0.0033
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	pyrene	0.637837204	0.00259
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	pyrene	0.215738483	0.00093
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	pyrene	0.064557029	0.00657
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	pyrene	0.093485034	0.00471
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	pyrene	0.376635858	0.00081
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	pyrene	0.060300157	0.002515
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	pyrene	0.274704817	0.00227
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	pyrene	0.261297529	0.00109
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	pyrene	0.149305005	0.002205
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	pyrene	0.090282481	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	pyrene	0.051733497	0.00162
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	pyrene	0.175805465	0.00126
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	pyrene	0.415481386	0.0047675
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	pyrene	0.636766316	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	pyrene	0.060602057	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	pyrene	0.115550099	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	pyrene	0.081584911	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	pyrene	0.154858301	0.00146
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	single or multiple organisms	pyrene	0.002581901	0.039
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	pyrene	0.19782391	0.00098
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	pyrene	0.008877017	0.015
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	pyrene	0.062441474	0.00367
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	pyrene	0.00676799	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	pyrene	0.016190879	0.00607
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	pyrene	0.011041478	0.00454
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	pyrene	0.035594411	0.00355
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	pyrene	0.030981902	0.00504
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	pyrene	0.023437518	0.00554
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	pyrene	0.055486514	0.00384
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	pyrene	0.060702446	0.00488
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	pyrene	0.036566462	0.00479
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	pyrene	0.047959758	0.00819
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	pyrene	0.001194561	0.00922
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	pyrene	0.014007707	0.00424
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	pyrene	0.000395715	0.01323
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	pyrene	0.000367524	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	pyrene	0.001012932	0.01121
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	pyrene	0.001675958	0.00642
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	pyrene	0.010451368	0.01232
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	pyrene	0.020039384	0.0029
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	pyrene	0.209344731	0.00888
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	pyrene	0.030091981	0.0039
PORT01	Portland Harbor	clam (Macoma nasuta)	Macoma nasuta	no shell	pyrene	0.230351691	0.01
PORT01	Portland Harbor	clam (Macoma nasuta)	Macoma nasuta	no shell	pyrene	0.236199098	0.017
PORT01	Portland Harbor	clam (Macoma nasuta)	Macoma nasuta	no shell	pyrene	0.193539872	0.008366633
					MEDIAN FOR HMW PAHs	**0.0712**	**0.0042**

Site ID	Superfund Site	Organism Common Name	Organism Latin Name	Biota Tissue Supplemental	Chemical	BSAF	Lipid content (fraction)
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	1-methylnaphthalene	0.383767665	0.003875
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	1-methylnaphthalene	1.785609334	0.00227
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	1-methylnaphthalene	0.733610834	0.00093
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	1-methylnaphthalene	0.520642667	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	1-methylnaphthalene	0.640286914	0.0047675
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	1-methylnaphthalene	0.053812439	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	1-methylnaphthalene	0.071825398	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	1-methylnaphthalene	0.118742186	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	1-methylnaphthalene	0.325369012	0.00146
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	1-methylnaphthalene	0.292601003	0.00098
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	1-methylnaphthalene	0.165618914	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	1-methylnaphthalene	0.994332047	0.00367
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	1-methylnaphthalene	0.011758208	0.01323
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	1-methylnaphthalene	0.001716663	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	1-methylnaphthalene	0.895945951	0.00888
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	2-methylnaphthalene	9.057532751	0.0077
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	2-methylnaphthalene	9.132876455	0.0083
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	2-methylnaphthalene	0.682490945	0.003875
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	2-methylnaphthalene	0.969162979	0.00227
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	2-methylnaphthalene	0.767579932	0.00093
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	2-methylnaphthalene	0.519893569	0.0047675
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	2-methylnaphthalene	0.783457971	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	2-methylnaphthalene	0.054015178	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	2-methylnaphthalene	0.132594935	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	2-methylnaphthalene	0.165501894	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	2-methylnaphthalene	29.4246582	0.00146
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	2-methylnaphthalene	0.547839947	0.00098
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	2-methylnaphthalene	0.168736435	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	2-methylnaphthalene	0.99190901	0.00367
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	2-methylnaphthalene	0.003689823	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	2-methylnaphthalene	0.944256763	0.00888
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	2-methylnaphthalene	0.050690603	0.01232
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	acenaphthene	0.293132603	0.003875
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	acenaphthene	0.454126233	0.00285
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	acenaphthene	0.657761216	0.00415
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthene	1.42619172	0.0033
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	acenaphthene	1.430603527	0.00259
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthene	0.05232075	0.002515
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	acenaphthene	1.311013184	0.00227
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	acenaphthene	0.600701806	0.00093
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthene	0.115006278	0.00109
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthene	0.03305785	0.00126

ATTACHMENT G-2 TABLE 3
BSAFs FOR ORGANIC COMPOUNDS
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Site ID	Superfund Site	Organism Common Name	Organism Latin Name	Biota Tissue Supplemental	Chemical	BSAF	Lipid content (fraction)
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthene	0.119240271	0.002205
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthene	0.04199475	0.00127
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthene	0.069477163	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthene	0.023839932	0.00162
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthene	0.866000654	0.0047675
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthene	1.386659633	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthene	0.024548092	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthene	0.075381678	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthene	0.143735362	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthene	0.167514672	0.00146
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthene	0.097703714	0.00098
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	acenaphthene	0.04422459	0.015
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	acenaphthene	0.001354397	0.016
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	acenaphthene	0.120286627	0.00355
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthene	0.052439688	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthene	0.009840393	0.00607
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthene	0.004218302	0.00454
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	acenaphthene	0.045227403	0.00479
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthene	0.051278354	0.00504
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	acenaphthene	0.070503293	0.00554
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthene	0.043488199	0.00384
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthene	0.05182185	0.00488
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthene	0.000805692	0.01323
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthene	0.00490901	0.00922
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthene	0.01094261	0.01121
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthene	0.015439149	0.0029
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthene	0.003295208	0.00642
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthene	0.083950331	0.00819
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthene	0.517267279	0.00888
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthene	0.000492212	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthene	0.010159294	0.01232
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthene	0.036386766	0.0039
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	acenaphthylene	0.457945963	0.003875
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	acenaphthylene	0.265500647	0.00679
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	acenaphthylene	0.226974529	0.00878
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	acenaphthylene	0.34400523	0.00569
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	acenaphthylene	0.119515658	0.0035
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	acenaphthylene	0.132548385	0.00636
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	acenaphthylene	0.165732369	0.00415
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	acenaphthylene	0.056459343	0.00893
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthylene	2.210153555	0.0033
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	acenaphthylene	4.212004109	0.00259
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	acenaphthylene	0.192086391	0.00657
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthylene	0.104504015	0.00471
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	acenaphthylene	0.33632133	0.00081
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthylene	0.221962032	0.002515
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	acenaphthylene	0.127543524	0.00227
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	acenaphthylene	5.074391401	0.00093
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthylene	0.841602509	0.00109
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthylene	0.280423279	0.00126
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthylene	0.454105374	0.002205
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthylene	0.524702116	0.00127
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthylene	0.486431545	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	acenaphthylene	0.28237935	0.00162
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthylene	1.202675974	0.00098
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthylene	0.903619785	0.0047675
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	single or multiple organisms	acenaphthylene	0.014931741	0.039
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthylene	4.870068507	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthylene	0.12620347	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthylene	0.250276229	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthylene	0.130618728	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	acenaphthylene	1.046940625	0.00146
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	acenaphthylene	0.037496595	0.015
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	acenaphthylene	0.008538317	0.016
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	acenaphthylene	0.029286833	0.00355
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthylene	0.019545951	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthylene	0.031310635	0.00607
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthylene	0.03912242	0.00454
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	acenaphthylene	0.022546973	0.00479
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthylene	0.046593932	0.00504
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	acenaphthylene	0.02175166	0.00554
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthylene	0.041097824	0.00384
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthylene	0.05580651	0.00488
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthylene	0.001728668	0.01323
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthylene	0.001751205	0.00922
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthylene	0.063041812	0.00424
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthylene	0.001230791	0.01121
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthylene	0.036904009	0.0029
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthylene	0.00614522	0.00642
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthylene	0.069225432	0.00819
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthylene	0.20162775	0.00888
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthylene	0.001048061	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	acenaphthylene	0.005803811	0.01232
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	acenaphthylene	0.021394541	0.0039
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	anthracene	4.489528391	0.00685
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	anthracene	1.515469595	0.0181
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	anthracene	23.70037086	0.0041
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	anthracene	0.251567429	0.003875
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	anthracene	0.274403974	0.00569
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	anthracene	0.245868721	0.00679
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	anthracene	0.249072226	0.00878
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	anthracene	0.206371543	0.00254
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	anthracene	0.108043068	0.0035
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	anthracene	0.225412691	0.00285
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	anthracene	0.266016809	0.00352
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	anthracene	1.905346943	0.00692
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	anthracene	1.033273469	0.00278
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	anthracene	0.119513615	0.00636
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	anthracene	0.275997641	0.00181
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	anthracene	0.143124828	0.00031
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	anthracene	0.087235985	0.00415
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	anthracene	0.034819666	0.00893
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	anthracene	0.366912369	0.0033
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	anthracene	0.673136437	0.00259
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	anthracene	0.100488196	0.00657
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	anthracene	0.121452547	0.00471
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	anthracene	0.341907226	0.00081
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	anthracene	0.059040557	0.002515
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	anthracene	0.170617443	0.00227
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	anthracene	0.530397479	0.00093
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	anthracene	0.191449728	0.00109
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	anthracene	0.16414348	0.002205
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	anthracene	0.106769442	0.00127
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	anthracene	0.141955506	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	anthracene	0.077601413	0.00162
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	anthracene	0.119887954	0.00126
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	anthracene	0.226500155	0.00098
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	anthracene	0.309713849	0.0047675
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	single or multiple organisms	anthracene	0.01398497	0.039
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	anthracene	1.489378459	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	anthracene	0.035276605	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	anthracene	0.097624997	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	anthracene	0.091393444	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	anthracene	0.20301834	0.00146
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	anthracene	0.002604331	0.016
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	anthracene	0.038716445	0.015

ATTACHMENT G-2 TABLE 3
BSAFs FOR ORGANIC COMPOUNDS
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Site ID	Superfund Site	Organism Common Name	Organism Latin Name	Biota Tissue Supplemental	Chemical	BSAF	Lipid content (fraction)
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	anthracene	0.038294632	0.00355
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	anthracene	0.008948552	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	anthracene	0.013240322	0.00607
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	anthracene	0.125975874	0.00367
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	anthracene	0.007767975	0.00454
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	anthracene	0.036716382	0.00384
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	anthracene	0.047188454	0.00479
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	anthracene	0.028242163	0.00504
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	anthracene	0.017718411	0.00554
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	anthracene	0.049482581	0.00488
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	anthracene	0.001159111	0.00922
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	anthracene	0.006836906	0.00424
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	anthracene	0.001058855	0.01121
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	anthracene	0.020636038	0.0029
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	anthracene	0.001972682	0.00642
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	anthracene	0.057473471	0.00819
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	anthracene	0.000630417	0.01323
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	anthracene	0.21312233	0.00888
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	anthracene	0.000301379	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	anthracene	0.006627962	0.01232
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	anthracene	0.017799072	0.0039
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluorene	0.265362586	0.003875
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluorene	0.369729973	0.00878
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluorene	0.172376993	0.00679
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluorene	0.590107336	0.00569
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluorene	0.419450479	0.00285
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluorene	0.180486055	0.00636
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluorene	0.256281883	0.00657
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluorene	0.345709033	0.00471
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluorene	0.824940471	0.00081
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluorene	0.323275862	0.00352
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluorene	2.397847311	0.00692
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluorene	1.488645922	0.00287
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluorene	2.370379596	0.00278
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluorene	0.567803939	0.00415
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	fluorene	0.179147869	0.00893
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluorene	0.682035689	0.0033
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluorene	1.445382471	0.00259
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluorene	0.115659252	0.002515
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluorene	10.73127808	0.00227
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	fluorene	0.369489663	0.00093
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	fluorene	0.054702563	0.015
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluorene	0.175538503	0.00109
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluorene	0.224067096	0.002205
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluorene	0.2650072	0.00127
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluorene	0.399708356	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluorene	0.052649277	0.00162
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	fluorene	0.121515684	0.00126
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	fluorene	0.001448349	0.016
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluorene	0.649913001	0.0047675
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluorene	7.153028891	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluorene	0.041001375	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluorene	0.146091201	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluorene	0.16595001	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluorene	0.336122097	0.00146
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	fluorene	0.229179332	0.00098
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	single or multiple organisms	fluorene	0.035954282	0.039
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluorene	0.027478082	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluorene	0.011515717	0.00607
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluorene	0.007008225	0.00454
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	fluorene	0.071470686	0.00355
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	fluorene	0.049590805	0.00479
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluorene	0.047773094	0.00384
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluorene	0.053178293	0.00504
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	fluorene	0.048451455	0.00554
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluorene	0.051209614	0.00488
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluorene	0.002301067	0.00922
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluorene	0.006953472	0.00424
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluorene	0.004483285	0.01121
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluorene	0.092052682	0.00819
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluorene	0.001922167	0.01323
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluorene	0.487682985	0.00888
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluorene	0.000532111	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluorene	0.004799256	0.00642
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	fluorene	0.01227501	0.01232
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluorene	0.021239476	0.0039
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	fluorene	0.020411408	0.0029
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	naphthalene	1.561929038	0.003875
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	naphthalene	3.154300004	0.00679
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	naphthalene	0.171252605	0.00893
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	naphthalene	0.753072124	0.00227
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	naphthalene	0.538771258	0.00093
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	naphthalene	0.011159881	0.015
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	naphthalene	0.439964249	0.00109
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	naphthalene	1.341185615	0.00127
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	naphthalene	0.415444909	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	naphthalene	0.218191982	0.00126
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	naphthalene	0.000432698	0.016
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	naphthalene	0.755547635	0.0047675
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	naphthalene	1.238844565	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	naphthalene	0.036864085	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	naphthalene	0.09491151	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	naphthalene	0.080469572	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	naphthalene	0.26603684	0.00146
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	naphthalene	0.286151603	0.00098
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	single or multiple organisms	naphthalene	0.051936266	0.039
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	naphthalene	0.19059365	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	naphthalene	1.322088053	0.00367
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	naphthalene	0.004638289	0.02663
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	phenanthrene	8.861042974	0.0041
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	phenanthrene	0.220515182	0.003875
CALC01	Calcasieu Estuary	brackish water clam	Rangia cuneata	single or multiple organisms	phenanthrene	1.699732317	0.00685
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	phenanthrene	0.581329037	0.0181
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	phenanthrene	3.917980842	0.0077
CALC01	Calcasieu Estuary	fiddler crab	Uca sp.	single or multiple organisms	phenanthrene	3.44718097	0.0083
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	phenanthrene	0.199093674	0.00679
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	phenanthrene	0.456994416	0.00878
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	phenanthrene	0.381717554	0.00569
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	phenanthrene	0.149952448	0.00254
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	phenanthrene	0.153980739	0.0035
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	phenanthrene	0.164629508	0.00285
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	phenanthrene	0.275317139	0.00352
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	phenanthrene	1.352507205	0.00692
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	phenanthrene	1.503073592	0.00287
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	phenanthrene	1.919635059	0.00278
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	phenanthrene	0.133609516	0.00636
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	phenanthrene	0.334017053	0.00181
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	phenanthrene	0.655021174	0.00031
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	phenanthrene	0.105361571	0.00415
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	phenanthrene	0.046620162	0.00893
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	phenanthrene	0.246512737	0.0033
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	phenanthrene	0.308114236	0.00259
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	phenanthrene	0.220104693	0.00093
DKTR01	NETC, Derecktor Shipyard	blue mussel	Mytilus edulis	composite	phenanthrene	0.073429169	0.00657
DKTR01	NETC, Derecktor Shipyard	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	phenanthrene	0.057170862	0.00471
DKTR01	NETC, Derecktor Shipyard	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	phenanthrene	0.228356926	0.00081

ATTACHMENT G-2 TABLE 3
BSAFs FOR ORGANIC COMPOUNDS
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Site ID	Superfund Site	Organism Common Name	Organism Latin Name	Biota Tissue Supplemental	Chemical	BSAF	Lipid content (fraction)
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	phenanthrene	0.041878605	0.002515
MCAL01	NETC, McAllister Point Landfill	hard clam (Pitar morrhuana)	Pitar morrhuana	composite	phenanthrene	0.354277748	0.00227
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	phenanthrene	0.113667582	0.00126
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	phenanthrene	0.117447003	0.00109
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	phenanthrene	0.119071182	0.002205
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	phenanthrene	0.040123574	0.00127
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	phenanthrene	0.07182706	0.00239
MCAL01	NETC, McAllister Point Landfill	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	composite	phenanthrene	0.030849168	0.00162
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	phenanthrene	0.67702524	0.0047675
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	phenanthrene	1.688889803	0.004236667
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	phenanthrene	0.040475082	0.00321
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	phenanthrene	0.090702673	0.0028
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	phenanthrene	0.126507478	0.00244
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	phenanthrene	0.212466812	0.00146
MCAL01	NETC, McAllister Point Landfill	blue mussel	Mytilus edulis	composite	phenanthrene	0.164215336	0.00098
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	single or multiple organisms	phenanthrene	0.006202562	0.039
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	phenanthrene	0.001032356	0.016
MCBX01	McCormick & Baxter	crayfish (probably Pacifasticus leniusculus)	probably Pacifasticus leniusculus	composite	phenanthrene	0.023908769	0.015
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	phenanthrene	0.00577252	0.00638
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	phenanthrene	0.092962091	0.00367
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	phenanthrene	0.008236333	0.00607
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	phenanthrene	0.004155624	0.00454
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	phenanthrene	0.052450702	0.00355
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	phenanthrene	0.004366483	0.00424
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	phenanthrene	0.020153821	0.00554
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	phenanthrene	0.029008213	0.00384
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	phenanthrene	0.040932187	0.00488
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Pitar morrhuana)	Pitar morrhuana	single or multiple organisms	phenanthrene	0.041274127	0.00479
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	phenanthrene	0.000196611	0.01323
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	phenanthrene	0.000554762	0.00922
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	phenanthrene	0.000155851	0.02663
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	phenanthrene	0.050072483	0.00819
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	phenanthrene	0.000666502	0.01121
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	phenanthrene	0.000576676	0.00642
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	phenanthrene	0.005438035	0.01232
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	phenanthrene	0.00977791	0.0029
OFTA01	NETC, Old Fire Fighting Training Area	blue mussel	Mytilus edulis	single or multiple organisms	phenanthrene	0.224173378	0.00888
OFTA01	NETC, Old Fire Fighting Training Area	hard clam (Mercenaria mercenaria)	Mercenaria mercenaria	single or multiple organisms	phenanthrene	0.01575045	0.0039
					MEDIAN FOR LMW PAHs	**0.1237**	**0.0042**

Site ID	Superfund Site	Organism Common Name	Organism Latin Name	Biota Tissue Supplemental	Chemical	BSAF	Lipid content (fraction)
CENT01	Centredale Manor	emerging insects	emerging insects	composite	TotalPCB	0.417469791	0.0249
CENT01	Centredale Manor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.235813184	0.027
KALZ01	Kalamazoo River	arachnid	arachnid	NR	TotalPCB	0.112010371	0.0379
KALZ01	Kalamazoo River	coleoptera benthic invertebrate	coleoptera benthic invertebrate	NR	TotalPCB	1.944309089	0.055
KALZ01	Kalamazoo River	coleoptera emerging insect	coleoptera emerging insect	NR	TotalPCB	0.10062184	0.0419
KALZ01	Kalamazoo River	coleoptera emerging insect	coleoptera emerging insect	NR	TotalPCB	0.105245579	0.105
KALZ01	Kalamazoo River	crayfish	crayfish	NR	TotalPCB	5.166735678	0.006495
KALZ01	Kalamazoo River	crayfish	crayfish	NR	TotalPCB	0.634823615	0.1898
KALZ01	Kalamazoo River	crayfish	crayfish	NR	TotalPCB	0.553241583	0.033016667
KALZ01	Kalamazoo River	crayfish	crayfish	NR	TotalPCB	1.608508348	0.0118
KALZ01	Kalamazoo River	diptera benthic invertebrate	diptera benthic invertebrate	NR	TotalPCB	1.119850382	0.0275
KALZ01	Kalamazoo River	diptera emerging insect	diptera emerging insect	NR	TotalPCB	0.21985615	0.084933333
KALZ01	Kalamazoo River	diptera emerging insect	diptera emerging insect	NR	TotalPCB	0.154699704	0.0764
KALZ01	Kalamazoo River	ephemeroptera benthic invertebrate	ephemeroptera benthic invertebrate	NR	TotalPCB	1.614271077	0.0489
KALZ01	Kalamazoo River	ephemeroptera benthic invertebrate	ephemeroptera benthic invertebrate	NR	TotalPCB	1.022589698	0.070469
KALZ01	Kalamazoo River	hemiptera emerging insect	hemiptera emerging insect	NR	TotalPCB	0.053	0.059
KALZ01	Kalamazoo River	hymenoptera emerging insect	hymenoptera emerging insect	NR	TotalPCB	1.701963384	0.0282
KALZ01	Kalamazoo River	hymenoptera emerging insect	hymenoptera emerging insect	NR	TotalPCB	1.268212191	0.0465
KALZ01	Kalamazoo River	isopoda	isopoda	NR	TotalPCB	0.92417245	0.071
KALZ01	Kalamazoo River	isopoda	isopoda	NR	TotalPCB	0.717987421	0.042544
KALZ01	Kalamazoo River	leech	leech	NR	TotalPCB	0.887337121	0.023571
KALZ01	Kalamazoo River	megaloptera benthic invertebrate	megaloptera benthic invertebrate	NR	TotalPCB	1.584879783	0.04645
KALZ01	Kalamazoo River	megaloptera benthic invertebrate	megaloptera benthic invertebrate	NR	TotalPCB	2.184555604	0.0473
KALZ01	Kalamazoo River	megaloptera benthic invertebrate	megaloptera benthic invertebrate	NR	TotalPCB	0.571999589	0.0273
KALZ01	Kalamazoo River	megaloptera benthic invertebrate	megaloptera benthic invertebrate	NR	TotalPCB	0.851905385	0.0226
KALZ01	Kalamazoo River	megaloptera benthic invertebrate	megaloptera benthic invertebrate	NR	TotalPCB	0.256218256	0.0434
KALZ01	Kalamazoo River	megaloptera emerging insect	megaloptera emerging insect	NR	TotalPCB	0.66009873	0.0616
KALZ01	Kalamazoo River	mixed benthic invertebrates	mixed benthic invertebrates	NR	TotalPCB	3.151844355	0.0213
KALZ01	Kalamazoo River	mixed benthic invertebrates	mixed benthic invertebrates	NR	TotalPCB	2.658258995	0.0883
KALZ01	Kalamazoo River	mixed benthic invertebrates	mixed benthic invertebrates	NR	TotalPCB	0.79666075	0.014
KALZ01	Kalamazoo River	mixed benthic invertebrates	mixed benthic invertebrates	NR	TotalPCB	0.0317	0.5302
KALZ01	Kalamazoo River	mixed emerging insects	mixed emerging insects	NR	TotalPCB	0.761384737	0.0667
KALZ01	Kalamazoo River	molluska	molluska	NR	TotalPCB	4.747339038	0.0275
KALZ01	Kalamazoo River	neuroptera benthic invertebrate	neuroptera benthic invertebrate	NR	TotalPCB	1.843740363	0.0336
KALZ01	Kalamazoo River	odonata benthic invertebrate	odonata benthic invertebrate	NR	TotalPCB	0.250155685	0.04931
KALZ01	Kalamazoo River	odonata benthic invertebrate	odonata benthic invertebrate	NR	TotalPCB	0.20149087	0.0229
KALZ01	Kalamazoo River	odonata benthic invertebrate	odonata benthic invertebrate	NR	TotalPCB	0.27550646	0.01565
KALZ01	Kalamazoo River	orthoptera emerging insect	orthoptera emerging insect	NR	TotalPCB	0.01430066	0.04215
KALZ01	Kalamazoo River	orthoptera emerging insect	orthoptera emerging insect	NR	TotalPCB	0.00715	0.0294
KALZ01	Kalamazoo River	plecoptera benthic invertebrate	plecoptera benthic invertebrate	NR	TotalPCB	2.893552295	0.0423
KALZ01	Kalamazoo River	plecoptera benthic invertebrate	plecoptera benthic invertebrate	NR	TotalPCB	1.959032719	0.0244
KALZ01	Kalamazoo River	plecoptera benthic invertebrate	plecoptera benthic invertebrate	NR	TotalPCB	1.057931469	0.035229
KALZ01	Kalamazoo River	plecoptera benthic invertebrate	plecoptera benthic invertebrate	NR	TotalPCB	1.150167922	0.025369
KALZ01	Kalamazoo River	scuds	scuds	NR	TotalPCB	1.082216938	0.06022
KALZ01	Kalamazoo River	scuds	scuds	NR	TotalPCB	0.271827016	0.096937
KALZ01	Kalamazoo River	trichoptera benthic invertebrate	trichoptera benthic invertebrate	NR	TotalPCB	2.402621063	0.04205
KALZ01	Kalamazoo River	trichoptera benthic invertebrate	trichoptera benthic invertebrate	NR	TotalPCB	2.043238637	0.0447
KALZ01	Kalamazoo River	trichoptera benthic invertebrate	trichoptera benthic invertebrate	NR	TotalPCB	0.394179997	0.109098
KALZ01	Kalamazoo River	trichoptera emerging insect	trichoptera emerging insect	NR	TotalPCB	1.4508039	0.078892
KALZ01	Kalamazoo River	trichoptera emerging insect	trichoptera emerging insect	NR	TotalPCB	1.541754252	0.053
KALZ01	Kalamazoo River	trichoptera emerging insect	trichoptera emerging insect	NR	TotalPCB	0.418364926	0.0933
KALZ01	Kalamazoo River	trichoptera emerging insect	trichoptera emerging insect	NR	TotalPCB	0.46424943	0.0743
KALZ01	Kalamazoo River	trichoptera emerging insect	trichoptera emerging insect	NR	TotalPCB	0.0651	0.107
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.575508267	0.0044999
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.0656	0.0089999
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	2.39190019	0.003399933
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.146591185	0.0062999
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.3795038	0.01
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.650916427	0.0093999
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	9.816002669	0.0081
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.212939368	0.0069999
					MEDIAN FOR TOTAL PCBs	**0.72**	**0.042**

Notes:
Source of information is the BSAF Data Set available at http://www.epa.gov/med/Prods_Pubs/bsaf.htm.
Information presented for whole body freshwater and marine invertebrates.

HMW - High Molecular Weight.
LMW - Low Molecular Weight.
NETC - Naval Education & Training Center
NR - Not Reported.
PAHs - Polycyclic Aromatic Hydrocarbons.
PCBs - Polychlorinated Biphenyls.

ATTACHMENT G-2 TABLE 4
TOXICITY REFERENCE VALUES
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC	TRV (mg/kg $_{bw}$/day)	Endpoint	Effect	Chronic/ Subchronic	Species	Primary Reference	Source of Reference
Inorganics							
ARSENIC	2.24	NOAEL	reproduction & growth	chronic	birds	USEPA, 2005a	
ARSENIC	1.04	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2005a	
CADMIUM	1.47	NOAEL	reproduction & growth	chronic	birds	USEPA, 2005b	
CADMIUM	0.77	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2005b	
CHROMIUM, TOTAL	2.66	NOAEL	reproduction & growth	chronic	birds	USEPA, 2008	
CHROMIUM, TOTAL	2.4	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2008	
COPPER	4.05	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007b	
COPPER	5.6	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007b	
LEAD	1.63	NOAEL	reproduction & growth	chronic	birds	USEPA, 2005c	
LEAD	4.7	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2005c	
MERCURY	0.0064	estimated NOAEL	reproductive	chronic	mallard duck	Heinz, 1979	Sample et al., 1996
MERCURY	0.032	NOAEL	reproductive	chronic	rat	Verschuuren et al., 1976	Sample et al., 1996
NICKEL	6.71	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007c	
NICKEL	1.7	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007c	
SELENIUM	0.29	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007c	
SELENIUM	0.143	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007c	
SILVER	2.02	NOAEL	reproduction & growth	chronic	birds	USEPA, 2006	
SILVER	6.02	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2006	
ZINC	75.4	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007e	
ZINC	66.1	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007e	
Organics							
TOTAL HMW PAHs	0.615	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007f	
TOTAL LMW PAHs	65.6	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007f	
TOTAL LMW PAHs / HMW PAHs	2	NOAEL	systemic	chronic	nestling/starlings	Trust et al., 1994 [a]	
TOTAL PCBs	0.068	estimated NOAEL	reproduction	chronic	mouse	McCoy et al., 1995 [b]	Sample et al., 1996
TOTAL PCBs	0.18	estimated NOAEL	reproduction	chronic	pheasant	Dahlgren et al., 1972 [b]	Sample et al., 1996

Notes:
NOAELs were estimated if a NOAEL was not identified in the literature. The LOAEL was divided by 10 to derive an estimated NOAEL.

COPC - Chemical of Potential Concern.
HMW - High Molecular Weight.
LMW - Low Molecular Weight.
LOAEL - Lowest Observed Adverse Effects Level.
NOAEL - No Observed Adverse Effects Level.
PAHs - Polycyclic Aromatic Hydrocarbons.
PCBs - Polychlorinated Biphenyls.
TRV - Toxicological Reference Value

[a] The avian TRVs for the HMW and LMW PAHs are based on 7,12-dimethylbenz(a)anthracene.
[b] TRVs for Total PCBs are based on Aroclor 1254.

ATTACHMENT G-2 TABLE 5
POTENTIAL RISKS TO THE MARSH WREN IN THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE MARSH WREN	
Average Body Weight (kg)	0.011
Exposure Duration	1
Area Use Factor	1
Hyd. Soil/Sediment Consumption Rate (kgdw/day)	0.000026
Wetland Invertebrate Consumption Rate (kg_{dw}/day)	0.0029

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM DETECTED CONCENTRATIONS	Media Concentrations		Potential Daily Dose (mg/kg_{BW}/day)				
COPC	Soil / Hydric Soil / Tidal Stream Sediment (mg/kg_{dw})	Wetland Invertebrate (mg/kg_{dw})	Soil / Hydric Soil / Tidal Stream Sediment	Wetland Invertebrate	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics							
ARSENIC	2.6E+01	3.8E+00	6.4E-02	1.0E+00	1.1E+00	2.2E+00	4.8E-01
CADMIUM	2.9E+00	1.7E+00	7.0E-03	4.7E-01	4.7E-01	1.5E+00	3.2E-01
CHROMIUM, TOTAL	4.4E+01	4.4E+00	1.1E-01	1.2E+00	1.3E+00	2.7E+00	4.9E-01
COPPER	7.5E+01	1.2E+02	1.8E-01	3.2E+01	3.2E+01	4.1E+00	**7.8E+00**
LEAD	5.8E+02	4.1E+01	1.4E+00	1.1E+01	1.3E+01	1.6E+00	**7.7E+00**
MERCURY	2.9E-01	3.3E-01	7.0E-04	8.8E-02	8.9E-02	6.4E-03	**1.4E+01**
NICKEL	3.3E+01	1.6E+01	8.0E-02	4.3E+00	4.4E+00	6.7E+00	6.6E-01
SELENIUM	6.2E+00	6.1E+00	1.5E-02	1.6E+00	1.7E+00	2.9E-01	**5.7E+00**
SILVER	8.4E-01	1.7E+00	2.0E-03	4.6E-01	4.6E-01	2.0E+00	2.3E-01
ZINC	3.3E+02	6.4E+02	8.0E-01	1.7E+02	1.7E+02	6.6E+01	**2.6E+00**
Organics							
TOTAL HMW PAHs	3.7E+01	3.9E-01	9.0E-02	1.0E-01	1.9E-01	2.0E+00	9.7E-02
TOTAL LMW PAHs	4.4E+00	7.9E-02	1.1E-02	2.1E-02	3.2E-02	2.0E+00	1.6E-02
TOTAL PCB AROCLORS	2.3E+00	2.4E+00	5.6E-03	6.5E-01	6.6E-01	1.8E-01	**3.7E+00**

ATTACHMENT G-2 TABLE 6
POTENTIAL RISKS TO THE MEADOW VOLE IN THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE MEADOW VOLE	
Average Body Weight (kg)	0.033
Exposure Duration	1
Area Use Factor	1
Hyd. Soil/Sediment Consumption Rate (kg_{dw}/day)	0.000093
Wetland Plant Consumption Rate (kg_{dw}/day)	0.0077

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM DETECTED CONCENTRATIONS	Media Concentrations		Potential Daily Dose (mg/kg_{BW}/day)				
COPC	Soil / Hydric Soil / Tidal Stream Sediment (mg/kg_{dw})	Wetland Plant (mg/kg_{dw})	Soil / Hydric Soil / Tidal Stream Sediment	Wetland Plant	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics							
ARSENIC	2.6E+01	9.9E-01	7.4E-02	2.3E-01	3.1E-01	1.0E+00	2.9E-01
CADMIUM	2.9E+00	1.1E+00	8.1E-03	2.6E-01	2.7E-01	7.7E-01	3.5E-01
CHROMIUM, TOTAL	4.4E+01	1.8E+00	1.2E-01	4.3E-01	5.5E-01	2.4E+00	2.3E-01
COPPER	7.5E+01	1.1E+01	2.1E-01	2.5E+00	2.7E+00	5.6E+00	4.8E-01
LEAD	5.8E+02	9.4E+00	1.6E+00	2.2E+00	3.8E+00	4.7E+00	8.2E-01
MERCURY	2.9E-01	1.9E-01	8.1E-04	4.5E-02	4.6E-02	3.2E-02	**1.4E+00**
NICKEL	3.3E+01	1.5E+00	9.3E-02	3.5E-01	4.4E-01	1.7E+00	2.6E-01
SELENIUM	6.2E+00	3.8E+00	1.7E-02	8.9E-01	9.1E-01	1.4E-01	**6.3E+00**
SILVER	8.4E-01	1.2E-02	2.3E-03	2.7E-03	5.1E-03	6.0E+00	8.5E-04
ZINC	3.3E+02	1.2E+02	9.3E-01	2.8E+01	2.9E+01	7.5E+01	3.8E-01
Organics							
TOTAL HMW PAHs	3.7E+01	1.4E+00	1.0E-01	3.2E-01	4.3E-01	6.2E-01	6.9E-01
TOTAL LMW PAHs	4.4E+00	7.4E-01	1.2E-02	1.7E-01	1.9E-01	6.6E+01	2.8E-03
TOTAL PCB AROCLORS	2.3E+00	2.4E-01	6.5E-03	5.7E-02	6.3E-02	6.8E-02	9.3E-01

ATTACHMENT G-2 TABLE 7
POTENTIAL RISKS TO THE RACCOON IN THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE RACCOON	
Average Body Weight (kg)	5.78
Exposure Duration	1
Area Use Factor	1
Hyd. Soil/Sediment Consumption Rate (kg_{dw}/day)	0.0144
Wetland Plant Consumption Rate (kg_{dw}/day)	0.0645
Wetland Invertebrate Consumption Rate (kg_{dw}/day)	0.089

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM DETECTED CONCENTRATIONS	Media Concentrations			Potential Daily Dose (mg/kg_{BW}/day)					
COPC	Soil / Hydric Soil / Tidal Stream Sediment (mg/kg_{dw})	Wetland Invertebrate (mg/kg_{dw})	Wetland Plant (mg/kg_{dw})	Soil / Hydric Soil / Tidal Stream Sediment	Wetland Invertebrate	Wetland Plant	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics									
ARSENIC	2.6E+01	3.8E+00	9.9E-01	6.6E-02	5.8E-02	1.1E-02	1.4E-01	1.0E+00	1.3E-01
CADMIUM	2.9E+00	1.7E+00	1.1E+00	7.2E-03	2.7E-02	1.2E-02	4.6E-02	7.7E-01	6.0E-02
CHROMIUM, TOTAL	4.4E+01	4.4E+00	1.8E+00	1.1E-01	6.8E-02	2.0E-02	2.0E-01	2.4E+00	8.3E-02
COPPER	7.5E+01	1.2E+02	1.1E+01	1.9E-01	1.8E+00	1.2E-01	2.1E+00	5.6E+00	3.8E-01
LEAD	5.8E+02	4.1E+01	9.4E+00	1.5E+00	6.4E-01	1.1E-01	2.2E+00	4.7E+00	4.7E-01
MERCURY	2.9E-01	3.3E-01	1.9E-01	7.2E-04	5.1E-03	2.1E-03	7.9E-03	3.2E-02	2.5E-01
NICKEL	3.3E+01	1.6E+01	1.5E+00	8.3E-02	2.5E-01	1.7E-02	3.5E-01	1.7E+00	2.0E-01
SELENIUM	6.2E+00	6.1E+00	3.8E+00	1.5E-02	9.4E-02	4.2E-02	1.5E-01	1.4E-01	**1.1E+00**
SILVER	8.4E-01	1.7E+00	1.2E-02	2.1E-03	2.6E-02	1.3E-04	2.9E-02	6.0E+00	4.7E-03
ZINC	3.3E+02	6.4E+02	1.2E+02	8.2E-01	9.8E+00	1.3E+00	1.2E+01	7.5E+01	1.6E-01
Organics									
TOTAL HMW PAHs	3.7E+01	3.9E-01	1.4E+00	9.2E-02	6.0E-03	1.5E-02	1.1E-01	6.2E-01	1.8E-01
TOTAL LMW PAHs	4.4E+00	7.9E-02	7.4E-01	1.1E-02	1.2E-03	8.3E-03	2.0E-02	6.6E+01	3.1E-04
TOTAL PCB AROCLORS	2.3E+00	2.4E+00	2.4E-01	5.7E-03	3.7E-02	2.7E-03	4.6E-02	6.8E-02	6.7E-01

ATTACHMENT G-2 TABLE 8
POTENTIAL RISKS TO THE SHORT-TAILED SHREW IN THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE SHORT-TAILED SHREW	
Average Body Weight (kg)	0.016
Exposure Duration	1
Area Use Factor	1
Hyd. Soil/Sediment Consumption Rate (kg_{dw}/day)	0.000019
Wetland Invertebrate Consumption Rate (kg_{dw}/day)	0.0021

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_S \times C_S] + [IR_W \times C_W] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM DETECTED CONCENTRATIONS	Media Concentrations		Potential Daily Dose (mg/kg_{BW}/day)				
COPC	Soil / Hydric Soil / Tidal Stream Sediment (mg/kg_{dw})	Wetland Invertebrate (mg/kg_{dw})	Soil / Hydric Soil / Tidal Stream Sediment	Wetland Invertebrate	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ
Inorganics							
ARSENIC	2.6E+01	3.8E+00	3.1E-02	4.9E-01	5.2E-01	1.0E+00	5.0E-01
CADMIUM	2.9E+00	1.7E+00	3.4E-03	2.3E-01	2.3E-01	7.7E-01	3.0E-01
CHROMIUM, TOTAL	4.4E+01	4.4E+00	5.2E-02	5.8E-01	6.3E-01	2.4E+00	2.6E-01
COPPER	7.5E+01	1.2E+02	8.8E-02	1.5E+01	1.5E+01	5.6E+00	**2.7E+00**
LEAD	5.8E+02	4.1E+01	6.9E-01	5.4E+00	6.1E+00	4.7E+00	**1.3E+00**
MERCURY	2.9E-01	3.3E-01	3.4E-04	4.3E-02	4.3E-02	3.2E-02	**1.3E+00**
NICKEL	3.3E+01	1.6E+01	3.9E-02	2.1E+00	2.1E+00	1.7E+00	**1.3E+00**
SELENIUM	6.2E+00	6.1E+00	7.3E-03	8.0E-01	8.1E-01	1.4E-01	**5.6E+00**
SILVER	8.4E-01	1.7E+00	9.8E-04	2.2E-01	2.2E-01	6.0E+00	3.7E-02
ZINC	3.3E+02	6.4E+02	3.9E-01	8.3E+01	8.4E+01	7.5E+01	**1.1E+00**
Organics							
TOTAL HMW PAHs	3.7E+01	3.9E-01	4.3E-02	5.1E-02	9.4E-02	6.2E-01	1.5E-01
TOTAL LMW PAHs	4.4E+00	7.9E-02	5.2E-03	1.0E-02	1.5E-02	6.6E+01	2.4E-04
TOTAL PCB AROCLORS	2.3E+00	2.4E+00	2.7E-03	3.2E-01	3.2E-01	6.8E-02	**4.7E+00**

ATTACHMENT G-2 TABLE 9

SUMMARY OF SCREENING LEVEL FOOD WEB HQs IN THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA

ECOLOGICAL RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

	NOAEL-based HQs - Maximum Concentrations			
COPC	**Marsh Wren**	**Meadow Vole**	**Raccoon**	**Short-tailed Shrew**
Inorganics				
ARSENIC	4.8E-01	2.9E-01	1.3E-01	5.0E-01
CADMIUM	3.2E-01	3.5E-01	6.0E-02	3.0E-01
CHROMIUM, TOTAL	4.9E-01	2.3E-01	8.3E-02	2.6E-01
COPPER	**7.8E+00**	4.8E-01	3.8E-01	**2.7E+00**
LEAD	**7.7E+00**	8.2E-01	4.7E-01	**1.3E+00**
MERCURY	**1.4E+01**	**1.4E+00**	2.5E-01	**1.3E+00**
NICKEL	6.6E-01	2.6E-01	2.0E-01	**1.3E+00**
SELENIUM	**5.7E+00**	**6.3E+00**	**1.1E+00**	**5.6E+00**
SILVER	2.3E-01	8.5E-04	4.7E-03	3.7E-02
ZINC	**2.6E+00**	3.8E-01	1.6E-01	**1.1E+00**
Organics				
TOTAL HMW PAHs	9.7E-02	6.9E-01	1.8E-01	1.5E-01
TOTAL LMW PAHs	1.6E-02	2.8E-03	3.1E-04	2.4E-04
TOTAL PCB AROCLORS	**3.7E+00**	9.3E-01	6.7E-01	**4.7E+00**

Notes:

Maximum EPCs for screening level evaluation represent maximum detected concentrations.

Potential risk is calculated using the maximum detected concentrations and NOAEL-based TRVs.

HQs above 1 are bolded and highlighted.

COPC - Chemical of Potential Concern.

HMW - High Molecular Weight.

HQ - Hazard Quotient (Dose/TRV).

LMW - Low Molecular Weight.

NOAEL - No Observed Adverse Effect Level.

PAHs - Polycyclic Aromatic Hydrocarbons.

PCBs - Polychlorinated Biphenyls.

TRV - Toxicity Reference Value.

ATTACHMENT G-2 TABLE 10
REFERENCES CITED FOR THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA FOOD WEB MODEL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

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Attachment G-3

Step 3a Exposure Point Concentrations

Note: ProUCL input and output files are provided in Attachment B-2.

ATTACHMENT G-3 TABLE 1
EXPOSURE POINT CONCENTRATION SUMMARY TABLE - SURFACE SOIL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC	Units	Frequency of Detection	Percent Detected	Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	Median Detected Concentration	UCL [a]	UCL Basis	EPC	Statistic
OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA											
Polychlorinated Biphenyls (PCBs)											
Total PCB Aroclors	mg/kg	3 / 9	33%	0.11	0.25	0.16	0.13	NC	--	0.25	Maximum [b]
ON-PROJECT BLUE BEACH AREA											
Inorganics											
Antimony	mg/kg	27 / 27	100%	0.028	3.1	0.29	0.10	0.38	95% H-UCL	0.38	UCL
Cadmium	mg/kg	26 / 27	96%	0.016	12.0	1.0	0.32	2.2	KM H-UCL	2.2	UCL
Copper	mg/kg	27 / 27	100%	3.0	116	17.6	9.4	38.7	95% Chebyshev (Mean, Sd) UCL	38.7	UCL
Lead	mg/kg	27 / 27	100%	7.1	383	71.7	43.1	106	95% Adjusted Gamma UCL	106	UCL
Selenium	mg/kg	27 / 27	100%	0.08	0.46	0.20	0.17	0.23	95% Adjusted Gamma UCL	0.23	UCL
Zinc	mg/kg	27 / 27	100%	26.5	425	67.4	42.5	140	95% Chebyshev (Mean, Sd) UCL	140	UCL
Polychlorinated Biphenyls (PCBs)											
Total PCB Aroclors	mg/kg	3 / 3	100%	0.23	0.48	0.31	0.31	0.31	ISM Calc [c]	0.31	UCL
Semi-Volatile Organic Compounds (SVOCs)											
Benzoic acid	mg/kg	1 / 26	4%	5.0	5.0	5.0	5.0	NC	--	5.0	Maximum [b]
Bis-(2-Ethylhexyl)-Phthalate	mg/kg	4 / 27	15%	0.15	0.86	0.36	0.21	0.27	Gamma Adjusted KM-UCL	0.27	UCL
Volatile Organic Compounds (VOCs)											
Acetone	mg/kg	13 / 20	65%	0.0079	0.39	0.074	0.042	0.12	Gamma Adjusted KM-UCL	0.12	UCL

Notes:
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
ISM - Incremental Sampling Methodology.
ITRC - Interstate Technical Regulatory Council.
mg/kg - Milligrams per kilogram.
NC - Not Calculated.
UCL - Upper Confidence Limit.
USEPA - United States Environmental Protection Agency.

[a] Upper Confidence Limit (UCL) on the arithmetic mean concentration calculated using USEPA ProUCL Version 5.1. The UCL suggested by ProUCL is used, unless otherwise noted.
In cases where more than one UCL is suggested, the higher UCL is used, unless otherwise noted.
[b] With 3 or fewer detected results, a reliable UCL cannot be calculated. The maximum detected concentration was selected as the EPC.
[c] Total PCB results for the on-Project Blue Beach area are associated with soil samples collected from three sampling units (SUs) using an incremental sampling methodology (ISM). Selected EPC is equal to the weighted mean UCL concentration of the SU-specific 95% UCL based on SU size (calculated using the ITRC ISM calculator; see Attachment C).

ATTACHMENT G-3 TABLE 2
EXPOSURE POINT CONCENTRATION SUMMARY TABLE - COMBINED DATASET
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC	Units	Frequency of Detection	Percent Detected	Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	Median Detected Concentration	UCL [b]	UCL Basis	EPC	Statistic
OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA COMBINED DATASET [a]											
Inorganics											
Copper	mg/kg	35 / 35	100%	2.8	75.3	18.9	11.2	24.4	95% Adjusted Gamma UCL	24.4	UCL
Lead	mg/kg	53 / 53	100%	4.6	584	68.1	34.3	94.2	95% H-UCL	94.2	UCL
Mercury	mg/kg	45 53	85%	0.0091	0.289	0.076	0.044	0.094	KM H-UCL	0.094	UCL
Nickel	mg/kg	30 / 30	100%	2.3	30.4	11.7	10.6	14.1	95% Student's-t UCL	14.1	UCL
Selenium	mg/kg	41 / 53	77%	0.05	6.2	0.98	0.66	1.5	KM H-UCL	1.5	UCL
Zinc	mg/kg	35 / 35	100%	15.4	330	88.9	61.1	115	95% Adjusted Gamma UCL	115	UCL
Polychlorinated Biphenyls (PCBs)											
Total PCB Aroclors	mg/kg	23 / 41	56%	0.11	2.3	0.87	0.58	0.79	95% GROS Adjusted Gamma UCL	0.79	UCL

Notes:
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
mg/kg - Milligrams per kilogram.
UCL - Upper Confidence Limit.
USEPA - United States Environmental Protection Agency.

[a] Dataset includes hydric soil, sediment, and soil from off-project areas. Media has been grouped for foodweb modeling purposes.
[b] Upper Confidence Limit (UCL) on the arithmetic mean concentration calculated using USEPA ProUCL Version 5.1. The UCL suggested by ProUCL is used, unless otherwise noted.
In cases where more than one UCL is suggested, the higher UCL is used, unless otherwise noted.

ATTACHMENT G-3 TABLE 3
EXPOSURE POINT CONCENTRATION SUMMARY TABLE - SURFACE SEDIMENT
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC	Units	Frequency of Detection	Percent Detected	Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	Median Detected Concentration	UCL [a]	UCL Basis	EPC	Statistic
OFF-PROJECT NARRAGANSETT BAY AND BEACHFRONT AREA											
Polychlorinated Biphenyls (PCBs)											
Total PCB Aroclors	mg/kg	10 / 10	100%	0.070	0.083	0.075	0.076	0.077	95% Student's-t UCL	0.077	UCL
Volatile Organic Compounds (VOCs)											
Carbon Disulfide	mg/kg	11 / 20	55%	0.00083	0.011	0.0065	0.0079	0.0055	95% KM (t) UCL	0.0055	UCL
OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA											
Polychlorinated Biphenyls (PCBs)											
Total PCB Aroclors	mg/kg	10 / 18	56%	0.084	1.5	0.42	0.32	0.44	95% KM (t) UCL	0.44	UCL
Semi-Volatile Organic Compounds (SVOCs)											
Bis-(2-Ethylhexyl)-Phthalate	mg/kg	5 / 15	33%	0.11	2.2	0.59	0.18	1.0	95% KM (Chebyshev) UCL	1.0	UCL
Volatile Organic Compounds (VOCs)											
2-Butanone (MEK)	mg/kg	5 / 6	83%	0.0083	0.042	0.021	0.018	0.032	95% KM (t) UCL	0.032	UCL
Acetone	mg/kg	4 / 6	67%	0.061	0.28	0.16	0.14	0.20	95% KM (t) UCL	0.20	UCL
Carbon Disulfide	mg/kg	3 / 6	50%	0.0028	0.013	0.0068	0.0042	NC	--	0.013	Maximum [b]

Notes:
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
mg/kg - Milligrams per kilogram.
UCL - Upper Confidence Limit.
USEPA - United States Environmental Protection Agency.

[a] Upper Confidence Limit (UCL) on the arithmetic mean concentration calculated using USEPA ProUCL Version 5.1. The UCL suggested by ProUCL is used, unless otherwise noted.
In cases where more than one UCL is suggested, the higher UCL is used, unless otherwise noted.
[b] With 3 or fewer detected results, a reliable UCL cannot be calculated. The maximum detected concentration was selected as the EPC.

ATTACHMENT G-3 TABLE 4
EXPOSURE POINT CONCENTRATION SUMMARY TABLE - SURFACE HYDRIC SOIL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC	Units	Frequency of Detection	Percent Detected	Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	Median Detected Concentration	UCL [a]	UCL Basis	EPC	Statistic
OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA											
Inorganics											
Antimony	mg/kg	10 / 10	100%	0.099	1.2	0.43	0.35	0.60	95% Student's-t UCL	0.60	UCL
Cadmium	mg/kg	14 / 16	88%	0.058	2.4	0.46	0.28	0.91	Gamma Adjusted KM-UCL	0.91	UCL
Copper	mg/kg	10 / 10	100%	6.8	44.0	23.9	23.5	30.3	95% Student's-t UCL	30.3	UCL
Lead	mg/kg	16 / 16	100%	12.8	277	92.5	66.6	123	95% Student's-t UCL	123	UCL
Mercury	mg/kg	14 / 16	88%	0.044	0.21	0.12	0.12	0.13	95% KM (t) UCL	0.13	UCL
Selenium	mg/kg	15 / 16	94%	0.19	4.9	1.6	0.85	2.8	KM H-UCL	2.8	UCL
Thallium	mg/kg	7 / 10	70%	0.077	0.27	0.16	0.14	0.17	95% KM (t) UCL	0.17	UCL
Polychlorinated Biphenyls (PCBs)											
Total PCB Aroclors	mg/kg	10 / 16	63%	0.13	2.3	0.97	0.84	1.0	95% KM (t) UCL	1.0	UCL
Semi-Volatile Organic Compounds (SVOCs)											
2,4-Dichlorophenol	mg/kg	8 / 10	80%	0.56	1.8	0.96	0.70	1.2	KM H-UCL	1.2	UCL
Volatile Organic Compounds (VOCs)											
Acetone	mg/kg	5 / 6	83%	0.12	4.3	1.2	0.68	10.8	Gamma Adjusted KM-UCL	4.3	Maximum [c]
Carbon Disulfide	mg/kg	2 / 6	33%	0.0086	0.019	0.014	0.014	NC	--	0.019	Maximum [b]
Toluene	mg/kg	1 / 6	17%	0.072	0.072	0.072	0.072	NC	--	0.072	Maximum [b]

Notes:
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
mg/kg - Milligrams per kilogram.
NC - Not Calculated.
UCL - Upper Confidence Limit.
USEPA - United States Environmental Protection Agency.

[a] Upper Confidence Limit (UCL) on the arithmetic mean concentration calculated using USEPA ProUCL Version 5.1. The UCL suggested by ProUCL is used, unless otherwise noted.
In cases where more than one UCL is suggested, the higher UCL is used, unless otherwise noted.
[b] With 3 or fewer detected results, a reliable UCL cannot be calculated. The maximum detected concentration was selected as the EPC.
[c] The UCL exceeded the maximum detected concentration and the maximum detected concentration was selected as the EPC.

ATTACHMENT G-3 TABLE 5
EXPOSURE POINT CONCENTRATION SUMMARY TABLE - SURFACE WATER
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC	Units	Frequency of Detection	Percent Detected	Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	Median Detected Concentration	UCL [a]	UCL Basis	EPC	Statistic
OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA											
Inorganics - Dissolved											
Barium	ug/L	7 / 7	100%	4.1	16.2	9.9	9.7	13.6	95% Student's-t UCL	13.6	UCL
Inorganics - Total											
Barium	ug/L	7 / 7	100%	4.2	13.5	9.2	9.7	12.3	95% Student's-t UCL	12.3	UCL
Volatile Organic Compounds (VOCs)											
Carbon Disulfide	ug/L	1 / 10	10%	2.6	2.6	0.00082	0.00082	NC	--	2.6	Maximum [b]

Notes:
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
ISM - Incremental sampling methodology.
mg/kg - Milligrams per kilogram.
NC - Not Calculated.
UCL - Upper Confidence Limit.
USEPA - United States Environmental Protection Agency.

[a] Upper Confidence Limit (UCL) on the arithmetic mean concentration calculated using USEPA ProUCL Version 5.1. The UCL suggested by ProUCL is used, unless otherwise noted.
In cases where more than one UCL is suggested, the higher UCL is used, unless otherwise noted.
[b] With 3 or fewer detected results, a reliable UCL cannot be calculated. The maximum detected concentration was selected as the EPC.

ATTACHMENT G-3 TABLE 6
EXPOSURE POINT CONCENTRATION SUMMARY TABLE - POREWATER
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

COPC	Units	Frequency of Detection	Percent Detected	Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	Median Detected Concentration	UCL [a]	UCL Basis	EPC	Statistic
OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA											
Inorganics - Dissolved											
Barium	ug/L	10 / 10	100%	8.3	67.9	19.3	15.6	43.5	95% Chebyshev (Mean, Sd) UCL	43.5	UCL
Lead	ug/L	1 / 10	10%	19.6	19.6	19.6	19.6	NC	--	19.6	Maximum [b]
Inorganics - Total											
Barium	ug/L	10 / 10	100%	8.4	67.0	19.2	15.7	43.1	95% Chebyshev (Mean, Sd) UCL	43.1	UCL
Silver	ug/L	1 / 10	10%	0.51	0.51	0.51	0.51	NC	--	0.51	Maximum [b]
Volatile Organic Compounds (VOCs)											
Carbon Disulfide	ug/L	6 / 23	26%	0.20	1.1	0.64	0.60	0.46	95% KM (t) UCL	0.46	UCL
Toluene	ug/L	1 / 23	4%	2.8	2.8	2.8	2.8	NC	--	2.8	Maximum [b]
OFF-PROJECT NARRAGANSETT BAY AND BEACHFRONT AREA											
Inorganics - Dissolved											
Barium	ug/L	1 / 20	5%	29.1	29.1	29.1	29.1	NC	--	29.1	Maximum [b]
Inorganics - Total											
Barium	ug/L	2 / 20	10%	32.9	33.9	33.4	33.4	NC	--	33.9	Maximum [b]
Lead	ug/L	2 / 20	10%	17.8	20.8	19.3	19.3	NC	--	20.8	Maximum [b]

Notes:
COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
mg/kg - Milligrams per kilogram.
NC - Not Calculated.
UCL - Upper Confidence Limit.
USEPA - United States Environmental Protection Agency.

[a] Upper Confidence Limit (UCL) on the arithmetic mean concentration calculated using USEPA ProUCL Version 5.1. The UCL suggested by ProUCL is used, unless otherwise noted.
In cases where more than one UCL is suggested, the higher UCL is used, unless otherwise noted.
[b] With 3 or fewer detected results, a reliable UCL cannot be calculated. The maximum detected concentration was selected as the EPC.

Attachment G-4

Refined Food Web Model – On-Project Blue Beach Area

ATTACHMENT G-4
REFINED FOOD WEB MODEL - ON-PROJECT BLUE BEACH AREA
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BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

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ATTACHMENT G-4 TABLE 1
EXPOSURE PARAMETERS FOR WILDLIFE RECEPTORS FOR ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Receptor Species	Body Weight (kg)	Food Ingestion Rate (kg_{dw}/day)	Dietary Assumptions (% kg_{dw}/day)		Incidental Soil Ingestion (% kg_{dw}/day)	Average Home Range (acres)
			Soil Invertebrates	Terrestrial Plants		
Birds						
American robin *(Turdus migratorius)*	0.0804 [a]	0.0119 [b]	100% [c] 0.0119	-- --	6.4% [d] 0.0008	0.6095 [e]
Mammals						
Raccoon *(Procyon lotor)*	5.78 [a]	0.1535 [b]	58% [c] 0.0890	42% [c] 0.0645	9.4% [d] 0.014	1558 [e]
Short-tailed shrew *(Blarina brevicauda)*	0.0161 [a]	0.0021 [b]	100% [c] 0.0021	-- --	0.9% [d] 0.000019	0.96 [e]

General Notes:

BW - Body Weight g - grams

DW - Dry Weight kg - kilograms

FIR - Food Ingestion Rate

Notes continued on following page.

Notes for American robin

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for insectivorous birds developed by Nagy, 2001 [FIR (gdw/day) = $0.540*BW^{0.705}$] using average body weight.

[c] Diet assumed to be exclusively soil invertebrates.

[d] In the absence of data for the robin, the incidental soil ingestion rate is based on 50th percentile value for woodcock (USEPA, 2007a).

[e] Home range listed by USEPA (1993) ranges from 0.27 to 1.04 acres with an average of 0.6095 acres.

Notes for Raccoon

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for omnivorous mammals developed by Nagy, 2001 [FIR (g_{dw}/day) = $0.432*BW^{0.678}$] using average body weight.

[c] Diet composition based on the average of seasonal diets for raccoon in a Maryland forested bottomland (USEPA, 1993). Amphibian component of diet (12%) added to soil invertebrate component.

[d] The incidental soil ingestion rate is based on the value identified by Beyer (1994) for raccoons.

[e] Home range listed by USEPA (1993) ranges from 96 to 6325 acres with an average of 1558 acres.

Notes for Short-tailed Shrew

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for insectivorous mammals developed by Nagy, 2001 [FIR (kg_{dw}/day) = $0.373*BW^{0.622}$] using average body weight.

[c] An exclusive soil invertebrate diet was selected.

[d] The incidental soil ingestion rate is based on 50th percentile value for shrew (USEPA, 2007a).

[e] Average home range for short-tailed shrew in Michigan, Manitoba, and New York (USEPA, 1993).

ATTACHMENT G-4 TABLE 2

MEDIA AND TISSUE CONCENTRATIONS IN THE ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	Measured Media Concentrations [a]	**Estimated Soil Invertebrate Tissue**		**Estimated Plant Tissue**	
COPC	Maximum Surface Soil EPC (mg/kg_{dw})	Soil-to-Invertebrate Uptake Factor	Soil Invertebrate Tissue EPC (mg/kg_{dw})	Soil-to-Plant Uptake Factor	Terrestrial Plant Tissue EPC (mg/kg_{dw})
Inorganics					
CADMIUM	2.2	Eco-SSL regression [b]	15.3	Eco-SSL regression [d]	0.95
COPPER	38.7	0.515 [b]	20.0	Eco-SSL regression [d]	8.2
LEAD	106	Eco-SSL regression [b]	34.7	Eco-SSL regression [d]	3.6
ZINC	140	Eco-SSL regression [b]	433	Eco-SSL regression [d]	74.7
Organics					
TOTAL PCB AROCLORS	0.31	6.667 [c]	2.1	0.106 [e,f]	0.0329

Notes:
Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean.
PCB soil data are from incremental sampling and the EPC represents the area weighted mean concentration calculated based on three sampling unit-specific UCLs (see Attachment C).

COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
PCBs - Polychlorinated Biphenyls.
UCL - Upper Confidence Limit.
USEPA - United States Environmental Protection Agency.

[a] Value presented is the selected surface soil EPC in the On-Project Blue Beach area (see Attachments B & C).
[b] Soil-to-invertebrate uptake factors and regression equations recommended by USEPA in development of Ecological Soil Screening Levels (USEPA, 2007a)
cadmium ln(tissue concentration) = 0.795 * ln(soil concentration) + 2.114
lead ln(tissue concentration) = 0.807 * ln(soil concentration) - 0.218
zinc ln(tissue concentration) = 0.328 * ln(soil concentration) + 4.449
[c] Soil-to-earthworm uptake factors from Sample, et al (1998) - median value from Table 11.
[d] Soil-to-plant uptake factors and regression equations recommended by USEPA in development of Ecological Soil Screening Levels (USEPA, 2007a)
cadmium ln(tissue concentration) = 0.546 * ln(soil concentration) - 0.475
copper ln(tissue concentration) = 0.394 * ln(soil concentration) + 0.668
lead ln(tissue concentration) = 0.561 * ln(soil concentration) - 1.328
zinc ln(tissue concentration) = 0.554 * ln(soil concentration) + 1.575
[e] Soil-to-plant uptake factor obtained from Los Alamos National Laboratory (LANL) EcoRisk database version 4.1 (LANL, 2017).
[f] Value for Aroclor 1254 used for Total PCBs.

ATTACHMENT G-4 TABLE 3

TOXICITY REFERENCE VALUES

ECOLOGICAL RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

COPC	TRV ($mg/kg_{bw}/day$)	Endpoint	Effect	Chronic/ Subchronic	Species	Primary Reference	Source of Reference
Inorganics							
CADMIUM	1.47	NOAEL	reproduction & growth	chronic	birds	USEPA, 2005a	
CADMIUM	*6.35*	*LOAEL*	*reproduction & growth*	*chronic*	*birds*	*USEPA, 2005a*	
CADMIUM	0.77	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2005a	
CADMIUM	*6.9*	*LOAEL*	*reproduction & growth*	*chronic*	*mammals*	*USEPA, 2005a*	
COPPER	4.05	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007b	
COPPER	*34.87*	*LOAEL*	*reproduction & growth*	*chronic*	*birds*	*USEPA, 2007b*	
COPPER	5.6	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007b	
COPPER	*82.7*	*LOAEL*	*reproduction & growth*	*chronic*	*mammals*	*USEPA, 2007b*	
LEAD	1.63	NOAEL	reproduction & growth	chronic	birds	USEPA, 2005b	
LEAD	*44.6*	*LOAEL*	*reproduction & growth*	*chronic*	*birds*	*USEPA, 2005b*	
LEAD	4.7	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2005b	
LEAD	*186.4*	*LOAEL*	*reproduction & growth*	*chronic*	*mammals*	*USEPA, 2005b*	
ZINC	75.4	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007c	
ZINC	*297.58*	*LOAEL*	*reproduction & growth*	*chronic*	*mammals*	*USEPA, 2007c*	
ZINC	66.1	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007c	
ZINC	*171.44*	*LOAEL*	*reproduction & growth*	*chronic*	*birds*	*USEPA, 2007c*	
Organics							
TOTAL PCBs	0.068	estimated NOAEL	reproduction	chronic	mouse	McCoy et al., 1995 [a]	Sample et al., 1996
TOTAL PCBs	*0.68*	*LOAEL*	*reproduction*	*chronic*	*mouse*	*McCoy et al., 1995 [a]*	*Sample et al., 1996*
TOTAL PCBs	0.18	estimated NOAEL	reproduction	chronic	pheasant	Dahlgren et al., 1972 [a]	Sample et al., 1996
TOTAL PCBs	*1.8*	*LOAEL*	*reproduction*	*chronic*	*pheasant*	*Dahlgren et al., 1972 [a]*	*Sample et al., 1996*

Notes:
LOAEL values from USEPA Eco-SSL documents were calculated as the geometric mean of growth and reproduction LOAEL values.
NOAELs were estimated if a NOAEL was not identified in the literature. The LOAEL was divided by 10 to derive an estimated NOAEL.

COPC - Chemical of Potential Concern.
LOAEL - Lowest Observed Adverse Effects Level.
NOAEL - No Observed Adverse Effects Level.
PCBs - Polychlorinated Biphenyls.
TRV - Toxicological Reference Value

[a] TRVs for Total PCBs are based on Aroclor 1254.

ATTACHMENT G-4 TABLE 4
POTENTIAL RISKS TO THE AMERICAN ROBIN IN THE ON-PROJECT BLUE BEACH AREA - REFINED FOOD WEB MODEL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE AMERICAN ROBIN	
Average Body Weight (kg)	0.080
Exposure Duration	1
Area Use Factor	1
Soil Consumption Rate (kg_{dw}/day)	0.000762
Soil Invertebrate Consumption Rate (kg_{dw}/day)	0.0119

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_S \times C_S] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_S= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.

Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean (Attachment G-3).
Soil EPC for PCBs is based on incremental sampling and represents the area-wide weighted mean concentration (see Attachment C).
Area Use Factor set at 1. Exposure area size of 3.2 acres is larger than receptor home range shown in Table 1.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations		Potential Daily Dose (mg/kg_{BW}/day)						
COPC	Soil (mg/kg_{dw})	Soil Invertebrate (mg/kg_{dw})	Soil	Soil Invertebrate	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ	LOAEL-based TRV (mg/kg_{bw}/day)	LOAEL-based HQ
Inorganics									
CADMIUM	2.2E+00	1.5E+01	2.1E-02	2.3E+00	2.3E+00	1.5E+00	**1.6E+00**	6.4E+00	3.6E-01
COPPER	3.9E+01	2.0E+01	3.7E-01	3.0E+00	3.3E+00	4.1E+00	8.2E-01	3.5E+01	9.5E-02
LEAD	1.1E+02	3.5E+01	1.0E+00	5.1E+00	6.1E+00	1.6E+00	**3.8E+00**	4.5E+01	1.4E-01
ZINC	1.4E+02	4.3E+02	1.3E+00	6.4E+01	6.5E+01	6.6E+01	9.9E-01	1.7E+02	3.8E-01
Organics									
TOTAL PCB AROCLORS	3.1E-01	2.1E+00	2.9E-03	3.1E-01	3.1E-01	1.8E-01	**1.7E+00**	1.8E+00	1.7E-01

ATTACHMENT G-4 TABLE 5
POTENTIAL RISKS TO THE RACCOON IN THE ON-PROJECT BLUE BEACH AREA - REFINED FOOD WEB MODEL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE RACCOON	
Average Body Weight (kg)	5.780
Exposure Duration	1
Area Use Factor	0.0021
Soil Consumption Rate (kg_{dw}/day)	0.0144
Terrestrial Plant Consumption Rate (kg_{dw}/day)	0.0645
Soil Invertebrate Consumption Rate (kg_{dw}/day)	0.0890

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.
Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean (Attachment G-3).
Soil EPC for PCBs is based on incremental sampling and represents the area-wide weighted mean concentration (see Attachment C).
Area Use Factor (AUF) is based on exposure area size of 3.2 acres and receptor home range shown in Table 1.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations			Potential Daily Dose (mg/kg_{BW}/day)							
COPC	Soil (mg/kg_{dw})	Soil Invertebrate (mg/kg_{dw})	Terrestrial Plant (mg/kg_{dw})	Soil	Soil Invertebrate	Terrestrial Plant	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ	LOAEL-based TRV (mg/kg_{bw}/day)	LOAEL-based HQ
Inorganics											
CADMIUM	2.2E+00	1.5E+01	9.5E-01	1.1E-05	4.9E-04	2.2E-05	5.2E-04	7.7E-01	6.7E-04	6.9E+00	7.5E-05
COPPER	3.9E+01	2.0E+01	8.2E+00	2.0E-04	6.3E-04	1.9E-04	1.0E-03	5.6E+00	1.8E-04	8.3E+01	1.2E-05
LEAD	1.1E+02	3.5E+01	3.6E+00	5.4E-04	1.1E-03	8.3E-05	1.7E-03	4.7E+00	3.7E-04	1.9E+02	9.2E-06
ZINC	1.4E+02	4.3E+02	7.5E+01	7.2E-04	1.4E-02	1.7E-03	1.6E-02	7.5E+01	2.1E-04	3.0E+02	5.4E-05
Organics											
TOTAL PCB AROCLORS	3.1E-01	2.1E+00	3.3E-02	1.6E-06	6.5E-05	7.5E-07	6.8E-05	6.8E-02	9.9E-04	6.8E-01	9.9E-05

ATTACHMENT G-4 TABLE 6
POTENTIAL RISKS TO THE SHORT-TAILED SHREW IN THE ON-PROJECT BLUE BEACH AREA - REFINED FOOD WEB MODEL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE SHORT-TAILED SHREW	
Average Body Weight (kg)	0.016
Exposure Duration	1
Area Use Factor	1
Soil Consumption Rate (kg_{dw}/day)	0.000019
Soil Invertebrate Consumption Rate (kg_{dw}/day)	0.0021

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_S \times C_S] + [IR_W \times C_W] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_S = Incidental ingestion rate of sediment or soil (kg/day)
IR_W = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_S= Concentration of COPC in sediment or soil (mg/kg)
C_W= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.

Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean (Attachment G-3).
Soil EPC for PCBs is based on incremental sampling and represents the area-wide weighted mean concentration (see Attachment C).
Area Use Factor set at 1. Exposure area size of 3.2 acres is larger than receptor home range shown in Table 1.

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations		Potential Daily Dose (mg/kg_{BW}/day)						
COPC	Soil (mg/kg_{dw})	Soil Invertebrate (mg/kg_{dw})	Soil	Soil Invertebrate	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ	LOAEL-based TRV (mg/kg_{bw}/day)	LOAEL-based HQ
Inorganics									
CADMIUM	2.2E+00	1.5E+01	2.6E-03	2.0E+00	2.0E+00	7.7E-01	**2.6E+00**	6.9E+00	2.9E-01
COPPER	3.9E+01	2.0E+01	4.5E-02	2.6E+00	2.6E+00	5.6E+00	4.7E-01	8.3E+01	3.2E-02
LEAD	1.1E+02	3.5E+01	1.2E-01	4.5E+00	4.6E+00	4.7E+00	9.9E-01	1.9E+02	2.5E-02
ZINC	1.4E+02	4.3E+02	1.6E-01	5.6E+01	5.7E+01	7.5E+01	7.5E-01	3.0E+02	1.9E-01
Organics									
TOTAL PCB AROCLORS	3.1E-01	2.1E+00	3.6E-04	2.7E-01	2.7E-01	6.8E-02	**4.0E+00**	6.8E-01	4.0E-01

ATTACHMENT G-4 TABLE 7
SUMMARY OF REFINED FOOD WEB HQs IN THE ON-PROJECT BLUE BEACH AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	NOAEL-based HQs - Maximum EPC		
COPC	**American Robin**	**Raccoon**	**Short-tailed Shrew**
Inorganics			
CADMIUM	**1.6E+00**	6.7E-04	**2.6E+00**
COPPER	8.2E-01	1.8E-04	4.7E-01
LEAD	**3.8E+00**	3.7E-04	9.9E-01
ZINC	9.9E-01	2.1E-04	7.5E-01
Organics			
TOTAL PCB AROCLORS	**1.7E+00**	9.9E-04	**4.0E+00**

	LOAEL-based HQs - Maximum EPC		
COPC	**American Robin**	**Raccoon**	**Short-tailed Shrew**
Inorganics			
CADMIUM	3.6E-01	7.5E-05	2.9E-01
COPPER	9.5E-02	1.2E-05	3.2E-02
LEAD	1.4E-01	9.2E-06	2.5E-02
ZINC	3.8E-01	5.4E-05	1.9E-01
Organics			
TOTAL PCB AROCLORS	1.7E-01	9.9E-05	4.0E-01

Notes:
Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean (Attachment G-3).
PCB soil data are from incremental sampling and the EPC represents the area-wide weighted mean concentration calculated based on three sampling unit-specific UCLs (see Attachment C).
Potential risk is calculated using the maximum EPC and both NOAEL-and LOAEL-based TRVs.
HQs above 1 are bolded and highlighted.

COPC - Chemical of Potential Concern.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effect Level.
NOAEL - No Observed Adverse Effect Level.
PCBs - Polychlorinated Biphenyls.
TRV - Toxicity Reference Value.

ATTACHMENT G-4 TABLE 8
REFERENCES CITED FOR THE ON-PROJECT BLUE BEACH AREA FOOD WEB MODEL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

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Attachment G-5

Refined Food Web Model – Off-Project Red Maple Swamp/Tidal Stream Area

ATTACHMENT G-5
REFINED FOOD WEB MODEL - OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
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NORTH KINGSTOWN, RHODE ISLAND

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TABLE 3 BSAFs FOR ORGANIC COMPOUNDS
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ATTACHMENT G-5 TABLE 1
EXPOSURE PARAMETERS FOR WILDLIFE RECEPTORS IN OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Receptor Species	Body Weight (kg)	Food Ingestion Rate (kg_{dw}/day)	Dietary Assumptions (%; kg_{dw}/day)		Incidental Sediment Ingestion (%; kg_{dw}/day)	Average Home Range (acres)
			Wetland Invertebrates	Wetland Plants		
Birds						
Marsh Wren *(Cistothorus palustris)*	0.0106 [a]	0.0029 [b]	100% 0.0029	-- --	0.9% [d] 0.000026	0.295 [e]
Mammals						
Raccoon *(Procyon lotor)*	5.78 [a]	0.1535 [b]	58% [c] 0.0890	42% [c] 0.0645	9.4% [d] 0.014	1558 [e]
Meadow vole *(Microtus pennsylvanicus)*	0.033 [a]	0.0077 [b]	-- --	100% [c] 0.0077	1.2% [d] 0.000093	0.066 [e]
Short-tailed shrew *(Blarina brevicauda)*	0.0161 [a]	0.0021 [b]	100% [c] 0.0021	-- --	0.9% [d] 0.000019	0.96 [e]

General Notes:

BW - Body Weight g - grams

DW - Dry Weight kg - kilograms

FIR - Food Ingestion Rate

Notes for Marsh Wren

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for insectivorous birds developed by Nagy, 2001 [FIR (g_{dw}/day) = 0.540*$BW^{0.705}$] using average body weight.

[c] Diet assumed to be exclusively benthic invertebrates.

[d] In the absence of data for the wren, the incidental soil ingestion rate is based on 50th percentile value for shrew (consuming 100% earthworms; USEPA, 2007a).

[e] Home range for freshwater wetlands listed by USEPA (1993) ranges from 0.17 to 0.42 acres with an average of 0.295 acres.

Notes for Raccoon

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for omnivorous mammals developed by Nagy, 2001 [FIR (g_{dw}/day) = 0.432*$BW^{0.678}$] using average body weight.

[c] Diet composition based on the average of seasonal diets for raccoon in a Maryland forested bottomland (USEPA, 1993). Amphibian component of diet (12%) added to benthic invertebrate component.

[d] The incidental soil ingestion rate is based on the value identified by Beyer (1994) for raccoons.

[e] Home range listed by USEPA (1993) ranges from 96 to 6325 acres with an average of 1558 acres.

Meadow vole

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for herbivorous mammals developed by Nagy, 2001 [FIR (kg_{dw}/day) = 0.859*$BW^{0.628}$] using average body weight.

[c] Diet is expected to be composed entirely of plants.

[d] The incidental soil ingestion rate is based on 50th percentile value for vole (USEPA, 2007a).

[e] Home range listed by USEPA (1993) ranges from 0.000494 to 0.2051 acres with an average of 0.0659 acres.

Notes for Short-tailed Shrew

[a] Average of adult body weights listed by USEPA (1993).

[b] Food ingestion rate calculated using algorithm for insectivorous mammals developed by Nagy, 2001 [FIR (kg_{dw}/day) = 0.373*$BW^{0.622}$] using average body weight.

[c] An exclusive soil invertebrate diet was selected.

[d] The incidental soil ingestion rate is based on 50th percentile value for shrew (USEPA, 2007a).

[e] Average home range for short-tailed shrew in Michigan, Manitoba, and New York (USEPA, 1993).

ATTACHMENT G-5 TABLE 2

MEDIA AND TISSUE CONCENTRATIONS IN OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	Measured Media Concentrations [a]	**Estimated Wetland Invertebrate Tissue**			**Estimated Plant Tissue**		
COPC	Maximum Soil / Hydric Soil / Tidal Stream Sediment EPC (mg/kg_{dw})	Sediment-to-Invertebrate Uptake Factor		Maximum Wetland Invertebrate Tissue EPC (mg/kg_{dw})	Soil-to-Plant Uptake Factor		Maximum Wetland Plant Tissue EPC (mg/kg_{dw})
Inorganics							
COPPER	24.4	1.556	[b]	38.0	Eco-SSL regression	[e]	6.9
LEAD	94	0.071	[b]	6.7	Eco-SSL regression	[e]	3.4
MERCURY	0.094	1.1	[b]	0.11	0.663	[f]	0.062
NICKEL	14.1	0.486	[b]	6.8	Eco-SSL regression	[e]	0.78
SELENIUM	1.5	1.0	[d]	1.5	Eco-SSL regression	[e]	0.78
Organics							
TOTAL PCB AROCLORS	0.8	0.72	[c]	0.84	0.106	[f, g]	0.084

Notes:
Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean.

COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
PCBs - Polychlorinated Biphenyls.
USEPA - United States Environmental Protection Agency.

[a] Value presented is the 95 UCL from the following off-Project datasets: surface soil from the off-Project Red Maple Swamp walking path, hydric surface soil from the off-Project Red Maple Swamp, and surface sediment from the off-Project tidal stream (Attachment G-3).
[b] Benthic invertebrate uptake factors obtained from Bechtel Jacobs (1998; Table 2; all data). Value selected is median uptake factor for depurated and non-depurated invertebrates combined expressed on a dry weight basis.
Invertebrate tissue $_{dw}$ = (uptake factor x sediment concentration)
[c] Median biota-sediment accumulation factor (BSAF) and lipids content for benthic invertebrates obtained from BSAF Data Set available at http://www.epa.gov/med/Prods_Pubs/bsaf.htm. See Table 3 for data.
Median lipid values from supporting studies and median site-specific sediment organic carbon used to determine tissue levels.
Median lipid levels for benthic invertebrates were -
4.2% (0.042 fraction lipids) for PCBs
Median site-specific TOC is 13% (0.13 fraction organic carbon) based on samples collected from 20 locations in 2011 and 2019 (see Attachment A for data).
Invertebrate tissue $_{dw}$ = [BSAF x sediment concentration x (fraction lipid/fraction organic carbon)]/(1-% moisture)
[d] Sediment-to-invertebrate factors obtained from Los Alamos National Laboratory (LANL) EcoRisk database version 4.1 (LANL, 2017).
Invertebrate tissue $_{dw}$ = (uptake factor x sediment concentration)
[e] Soil-to-plant uptake factors and regression equations recommended by USEPA in development of Ecological Soil Screening Levels (USEPA, 2007a)

copper	ln(tissue concentration) = 0.394 * ln(soil concentration) + 0.668
lead	ln(tissue concentration) = 0.561 * ln(soil concentration) - 1.328
nickel	ln(tissue concentration) = 0.748 * ln(soil concentration) - 2.223
selenium	ln(tissue concentration) = 1.104 * ln(soil concentration) - 0.677

[f] Soil-to-plant uptake factor obtained from Los Alamos National Laboratory (LANL) EcoRisk database version 4.1 (LANL, 2017).
[g] Value for Aroclor 1254 used for Total PCBs.

ATTACHMENT G-5 TABLE 3
BSAFs FOR ORGANIC COMPOUNDS
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Site ID	Superfund Site	Organism Common Name	Organism Latin Name	Biota Tissue Supplemental	Chemical	BSAF	Lipid content (fraction)
CENT01	Centredale Manor	emerging insects	emerging insects	composite	TotalPCB	0.417469791	0.0249
CENT01	Centredale Manor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.235813184	0.027
KALZ01	Kalamazoo River	arachnid	arachnid	NR	TotalPCB	0.112010371	0.0379
KALZ01	Kalamazoo River	coleoptera benthic invertebrate	coleoptera benthic invertebrate	NR	TotalPCB	1.944309089	0.055
KALZ01	Kalamazoo River	coleoptera emerging insect	coleoptera emerging insect	NR	TotalPCB	0.10062184	0.0419
KALZ01	Kalamazoo River	coleoptera emerging insect	coleoptera emerging insect	NR	TotalPCB	0.105245579	0.105
KALZ01	Kalamazoo River	crayfish	crayfish	NR	TotalPCB	5.166735678	0.006495
KALZ01	Kalamazoo River	crayfish	crayfish	NR	TotalPCB	0.634823615	0.1898
KALZ01	Kalamazoo River	crayfish	crayfish	NR	TotalPCB	0.553241583	0.033016667
KALZ01	Kalamazoo River	crayfish	crayfish	NR	TotalPCB	1.608508348	0.0118
KALZ01	Kalamazoo River	diptera benthic invertebrate	diptera benthic invertebrate	NR	TotalPCB	1.119850382	0.0275
KALZ01	Kalamazoo River	diptera emerging insect	diptera emerging insect	NR	TotalPCB	0.21985615	0.084933333
KALZ01	Kalamazoo River	diptera emerging insect	diptera emerging insect	NR	TotalPCB	0.154699704	0.0764
KALZ01	Kalamazoo River	ephemeroptera benthic invertebrate	ephemeroptera benthic invertebrate	NR	TotalPCB	1.614271077	0.0489
KALZ01	Kalamazoo River	ephemeroptera benthic invertebrate	ephemeroptera benthic invertebrate	NR	TotalPCB	1.022589698	0.070469
KALZ01	Kalamazoo River	hemiptera emerging insect	hemiptera emerging insect	NR	TotalPCB	0.053	0.059
KALZ01	Kalamazoo River	hymenoptera emerging insect	hymenoptera emerging insect	NR	TotalPCB	1.701963384	0.0282
KALZ01	Kalamazoo River	hymenoptera emerging insect	hymenoptera emerging insect	NR	TotalPCB	1.268212191	0.0465
KALZ01	Kalamazoo River	isopoda	isopoda	NR	TotalPCB	0.92417245	0.071
KALZ01	Kalamazoo River	isopoda	isopoda	NR	TotalPCB	0.717987421	0.042544
KALZ01	Kalamazoo River	leech	leech	NR	TotalPCB	0.887337121	0.023571
KALZ01	Kalamazoo River	megaloptera benthic invertebrate	megaloptera benthic invertebrate	NR	TotalPCB	1.584879783	0.04645
KALZ01	Kalamazoo River	megaloptera benthic invertebrate	megaloptera benthic invertebrate	NR	TotalPCB	2.184555604	0.0473
KALZ01	Kalamazoo River	megaloptera benthic invertebrate	megaloptera benthic invertebrate	NR	TotalPCB	0.571999589	0.0273
KALZ01	Kalamazoo River	megaloptera benthic invertebrate	megaloptera benthic invertebrate	NR	TotalPCB	0.851905385	0.0226
KALZ01	Kalamazoo River	megaloptera benthic invertebrate	megaloptera benthic invertebrate	NR	TotalPCB	0.256218256	0.0434
KALZ01	Kalamazoo River	megaloptera emerging insect	megaloptera emerging insect	NR	TotalPCB	0.66009873	0.0616
KALZ01	Kalamazoo River	mixed benthic invertebrates	mixed benthic invertebrates	NR	TotalPCB	3.151844355	0.0213
KALZ01	Kalamazoo River	mixed benthic invertebrates	mixed benthic invertebrates	NR	TotalPCB	2.658258995	0.0883
KALZ01	Kalamazoo River	mixed benthic invertebrates	mixed benthic invertebrates	NR	TotalPCB	0.79666075	0.014
KALZ01	Kalamazoo River	mixed benthic invertebrates	mixed benthic invertebrates	NR	TotalPCB	0.0317	0.5302
KALZ01	Kalamazoo River	mixed emerging insects	mixed emerging insects	NR	TotalPCB	0.761384737	0.0667
KALZ01	Kalamazoo River	molluska	molluska	NR	TotalPCB	4.747339038	0.0275
KALZ01	Kalamazoo River	neuroptera benthic invertebrate	neuroptera benthic invertebrate	NR	TotalPCB	1.843740363	0.0336
KALZ01	Kalamazoo River	odonata benthic invertebrate	odonata benthic invertebrate	NR	TotalPCB	0.250155685	0.04931
KALZ01	Kalamazoo River	odonata benthic invertebrate	odonata benthic invertebrate	NR	TotalPCB	0.20149087	0.0229
KALZ01	Kalamazoo River	odonata benthic invertebrate	odonata benthic invertebrate	NR	TotalPCB	0.27550646	0.01565
KALZ01	Kalamazoo River	orthoptera emerging insect	orthoptera emerging insect	NR	TotalPCB	0.01430066	0.04215
KALZ01	Kalamazoo River	orthoptera emerging insect	orthoptera emerging insect	NR	TotalPCB	0.00715	0.0294
KALZ01	Kalamazoo River	plecoptera benthic invertebrate	plecoptera benthic invertebrate	NR	TotalPCB	2.893552295	0.0423
KALZ01	Kalamazoo River	plecoptera benthic invertebrate	plecoptera benthic invertebrate	NR	TotalPCB	1.959032719	0.0244
KALZ01	Kalamazoo River	plecoptera benthic invertebrate	plecoptera benthic invertebrate	NR	TotalPCB	1.057931469	0.035229
KALZ01	Kalamazoo River	plecoptera benthic invertebrate	plecoptera benthic invertebrate	NR	TotalPCB	1.150167922	0.025369
KALZ01	Kalamazoo River	scuds	scuds	NR	TotalPCB	1.082216938	0.06022
KALZ01	Kalamazoo River	scuds	scuds	NR	TotalPCB	0.271827016	0.096937
KALZ01	Kalamazoo River	trichoptera benthic invertebrate	trichoptera benthic invertebrate	NR	TotalPCB	2.402621063	0.04205
KALZ01	Kalamazoo River	trichoptera benthic invertebrate	trichoptera benthic invertebrate	NR	TotalPCB	2.043238637	0.0447
KALZ01	Kalamazoo River	trichoptera benthic invertebrate	trichoptera benthic invertebrate	NR	TotalPCB	0.394179997	0.109098
KALZ01	Kalamazoo River	trichoptera emerging insect	trichoptera emerging insect	NR	TotalPCB	1.4508039	0.078892
KALZ01	Kalamazoo River	trichoptera emerging insect	trichoptera emerging insect	NR	TotalPCB	1.541754252	0.053
KALZ01	Kalamazoo River	trichoptera emerging insect	trichoptera emerging insect	NR	TotalPCB	0.418364926	0.0933
KALZ01	Kalamazoo River	trichoptera emerging insect	trichoptera emerging insect	NR	TotalPCB	0.46424943	0.0743
KALZ01	Kalamazoo River	trichoptera emerging insect	trichoptera emerging insect	NR	TotalPCB	0.0651	0.107
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.575508267	0.0044999
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.0656	0.0089999
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	2.39190019	0.003399933
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.146591185	0.0062999
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.3795038	0.01
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.650916427	0.0093999
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	9.816002669	0.0081
PORT01	Portland Harbor	unidentified crayfish	unidentified crayfish	composite	TotalPCB	0.212939368	0.0069999
					MEDIAN FOR TOTAL PCBs	**0.72**	**0.042**

Notes:
Source of information is the BSAF Data Set available at http://www.epa.gov/med/Prods_Pubs/bsaf.htm.
Information presented for whole body freshwater and marine invertebrates.

NR - Not Reported.
PCBs - Polychlorinated Biphenyls.

ATTACHMENT G-5 TABLE 4

TOXICITY REFERENCE VALUES

ECOLOGICAL RISK ASSESSMENT

BLUE BEACH DISPOSAL AREA

NORTH KINGSTOWN, RHODE ISLAND

COPC	TRV ($mg/kg_{bw}/day$)	Endpoint	Effect	Chronic/ Subchronic	Species	Primary Reference	Source of Reference
Inorganics							
COPPER	4.05	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007b	
COPPER	*34.87*	*LOAEL*	*reproduction & growth*	*chronic*	*birds*	*USEPA, 2007b*	
COPPER	5.6	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007b	
COPPER	*82.7*	*LOAEL*	*reproduction & growth*	*chronic*	*mammals*	*USEPA, 2007b*	
LEAD	1.63	NOAEL	reproduction & growth	chronic	birds	USEPA, 2005a	
LEAD	*44.6*	*LOAEL*	*reproduction & growth*	*chronic*	*birds*	*USEPA, 2005a*	
LEAD	4.7	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2005a	
LEAD	*186.4*	*LOAEL*	*reproduction & growth*	*chronic*	*mammals*	*USEPA, 2005a*	
MERCURY	0.0064	estimated NOAEL	reproductive	chronic	mallard duck	Heinz, 1979	Sample et al., 1996
MERCURY	*0.064*	*LOAEL*	*reproductive*	*chronic*	*mallard duck*	*Heinz, 1979*	*Sample et al., 1996*
MERCURY	0.032	NOAEL	reproductive	chronic	rat	Verschuuren et al., 1976	Sample et al., 1996
MERCURY	*0.16*	*LOAEL*	*reproductive*	*chronic*	*rat*	*Verschuuren et al., 1976*	*Sample et al., 1996*
NICKEL	6.71	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007c	
NICKEL	*18.57*	*LOAEL*	*reproduction & growth*	*chronic*	*birds*	*USEPA, 2007c*	
NICKEL	1.7	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007c	
NICKEL	*14.77*	*LOAEL*	*reproduction & growth*	*chronic*	*mammals*	*USEPA, 2007c*	
SELENIUM	0.29	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007d	
SELENIUM	*0.819*	*LOAEL*	*reproduction & growth*	*chronic*	*birds*	*USEPA, 2007d*	
SELENIUM	0.143	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007d	
SELENIUM	*0.661*	*LOAEL*	*reproduction & growth*	*chronic*	*mammals*	*USEPA, 2007d*	
Organics							
TOTAL PCBs	0.068	estimated NOAEL	reproduction	chronic	mouse	McCoy et al., 1995 [a]	Sample et al., 1996
TOTAL PCBs	*0.68*	*LOAEL*	*reproduction*	*chronic*	*mouse*	*McCoy et al., 1995 [a]*	*Sample et al., 1996*
TOTAL PCBs	0.18	estimated NOAEL	reproduction	chronic	pheasant	Dahlgren et al., 1972 [a]	Sample et al., 1996
TOTAL PCBs	*1.8*	*LOAEL*	*reproduction*	*chronic*	*pheasant*	*Dahlgren et al., 1972 [a]*	*Sample et al., 1996*

Notes:
LOAEL values from USEPA Eco-SSL documents were calculated as the geometric mean of growth and reproduction LOAEL values.
NOAELs were estimated if a NOAEL was not identified in the literature. The LOAEL was divided by 10 to derive an estimated NOAEL.

Notes:
NOAELs were estimated if a NOAEL was not identified in the literature. The LOAEL was divided by 10 to derive an estimated NOAEL.

COPC - Chemical of Potential Concern.
LOAEL - Lowest Observed Adverse Effects Level.
NOAEL - No Observed Adverse Effects Level.
PCBs - Polychlorinated Biphenyls.
TRV - Toxicological Reference Value

[a] TRVs for Total PCBs are based on Aroclor 1254.

ATTACHMENT G-5 TABLE 5
POTENTIAL RISKS TO THE MARSH WREN IN THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA - REFINED FOOD WEB MODEL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE MARSH WREN	
Average Body Weight (kg)	0.011
Exposure Duration	1
Area Use Factor	1
Hyd. Soil/Sediment Consumption Rate (kgdw/day)	0.000026
Wetland Invertebrate Consumption Rate (kg_{dw}/day)	0.0029

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_S \times C_S] + [IR_W \times C_W] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_S = Incidental ingestion rate of sediment or soil (kg/day)
IR_W = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_S= Concentration of COPC in sediment or soil (mg/kg)
C_W= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.
Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean (Attachment G-3).
Area Use Factor set at 1. Exposure area size of 7.6 acres is larger than receptor home range shown in Table 1.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations		Potential Daily Dose (mg/kg_{BW}/day)						
COPC	Soil / Hydric Soil / Tidal Stream Sediment (mg/kg_{dw})	Wetland Invertebrate (mg/kg_{dw})	Soil / Hydric Soil / Tidal Stream Sediment	Wetland Invertebrate	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ	LOAEL-based TRV (mg/kg_{bw}/day)	LOAEL-based HQ
Inorganics									
COPPER	2.4E+01	3.8E+01	5.9E-02	1.0E+01	1.0E+01	4.1E+00	**2.5E+00**	3.5E+01	2.9E-01
LEAD	9.4E+01	6.7E+00	2.3E-01	1.8E+00	2.0E+00	1.6E+00	**1.2E+00**	4.5E+01	4.5E-02
MERCURY	9.4E-02	1.1E-01	2.3E-04	2.9E-02	2.9E-02	6.4E-03	**4.5E+00**	6.4E-02	4.5E-01
NICKEL	1.4E+01	6.8E+00	3.4E-02	1.8E+00	1.9E+00	6.7E+00	2.8E-01	1.9E+01	1.0E-01
SELENIUM	1.5E+00	1.5E+00	3.6E-03	3.9E-01	3.9E-01	2.9E-01	**1.4E+00**	8.2E-01	4.8E-01
Organics									
TOTAL PCB AROCLORS	7.9E-01	8.4E-01	1.9E-03	2.2E-01	2.3E-01	1.8E-01	**1.3E+00**	1.8E+00	1.3E-01

ATTACHMENT G-5 TABLE 6
POTENTIAL RISKS TO THE MEADOW VOLE IN THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA - REFINED FOOD WEB MODEL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE MEADOW VOLE	
Average Body Weight (kg)	0.033
Exposure Duration	1
Area Use Factor	1
Hyd. Soil/Sediment Consumption Rate (kg_{dw}/day)	0.000093
Wetland Plant Consumption Rate (kg_{dw}/day)	0.0077

Total Daily Dose = $\frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.
Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean (Attachment G-3).
Area Use Factor set at 1. Exposure area size of 7.6 acres is larger than receptor home range shown in Table 1.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations		Potential Daily Dose (mg/kg_{BW}/day)						
COPC	Soil / Hydric Soil / Tidal Creek Sediment (mg/kg_{dw})	Wetland Plant (mg/kg_{dw})	Soil / Hydric Soil / Tidal Creek Sediment	Wetland Plant	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ	LOAEL-based TRV (mg/kg_{bw}/day)	LOAEL-based HQ
Inorganics									
COPPER	2.4E+01	6.9E+00	6.8E-02	1.6E+00	1.7E+00	5.6E+00	3.0E-01	8.3E+01	2.0E-02
LEAD	9.4E+01	3.4E+00	2.6E-01	7.9E-01	1.1E+00	4.7E+00	2.3E-01	1.9E+02	5.7E-03
MERCURY	9.4E-02	6.2E-02	2.6E-04	1.5E-02	1.5E-02	3.2E-02	4.6E-01	1.6E-01	9.3E-02
NICKEL	1.4E+01	7.8E-01	3.9E-02	1.8E-01	2.2E-01	1.7E+00	1.3E-01	1.5E+01	1.5E-02
SELENIUM	1.5E+00	7.8E-01	4.1E-03	1.8E-01	1.9E-01	1.4E-01	**1.3E+00**	6.6E-01	2.8E-01
Organics									
TOTAL PCB AROCLORS	7.9E-01	8.4E-02	2.2E-03	2.0E-02	2.2E-02	6.8E-02	3.2E-01	6.8E-01	3.2E-02

ATTACHMENT G-5 TABLE 7
POTENTIAL RISKS TO THE RACCOON IN THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA - REFINED FOOD WEB MODEL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE RACCOON	
Average Body Weight (kg)	5.78
Exposure Duration	1
Area Use Factor	0.0049
Hyd. Soil/Sediment Consumption Rate (kg_{dw}/day)	0.0144
Wetland Plant Consumption Rate (kg_{dw}/day)	0.0645
Wetland Invertebrate Consumption Rate (kg_{dw}/day)	0.089

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_s \times C_s] + [IR_w \times C_w] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)
AUF = Area use factor (ratio of the receptor's home range relative to the size of exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.
Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean (Attachment G-3).
Area Use Factor based on exposure area size of 7.6 acres and receptor home range shown in Table 1.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations			Potential Daily Dose (mg/kg_{BW}/day)				NOAEL-based TRV	NOAEL-based HQ	LOAEL-based TRV	LOAEL-based HQ
COPC	Soil / Hydric Soil / Tidal Stream Sediment (mg/kg_{dw})	Wetland Invertebrate (mg/kg_{dw})	Wetland Plant (mg/kg_{dw})	Soil / Hydric Soil / Tidal Stream Sediment	Wetland Invertebrate	Wetland Plant	Total	(mg/kg_{bw}/day)		(mg/kg_{bw}/day)	
Inorganics											
COPPER	2.4E+01	3.8E+01	6.9E+00	3.0E-04	2.8E-03	3.7E-04	3.5E-03	5.6E+00	6.3E-04	8.3E+01	4.2E-05
LEAD	9.4E+01	6.7E+00	3.4E+00	1.1E-03	5.0E-04	1.8E-04	1.8E-03	4.7E+00	3.9E-04	1.9E+02	9.8E-06
MERCURY	9.4E-02	1.1E-01	6.2E-02	1.1E-06	8.0E-06	3.4E-06	1.3E-05	3.2E-02	3.9E-04	1.6E-01	7.8E-05
NICKEL	1.4E+01	6.8E+00	7.8E-01	1.7E-04	5.1E-04	4.2E-05	7.2E-04	1.7E+00	4.3E-04	1.5E+01	4.9E-05
SELENIUM	1.5E+00	1.5E+00	7.8E-01	1.8E-05	1.1E-04	4.2E-05	1.7E-04	1.4E-01	1.2E-03	6.6E-01	2.5E-04
Organics											
TOTAL PCB AROCLORS	7.9E-01	8.4E-01	8.4E-02	9.6E-06	6.3E-05	4.5E-06	7.7E-05	6.8E-02	1.1E-03	6.8E-01	1.1E-04

ATTACHMENT G-5 TABLE 8
POTENTIAL RISKS TO THE SHORT-TAILED SHREW IN THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA - REFINED FOOD WEB MODEL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

ASSUMPTIONS FOR THE SHORT-TAILED SHREW	
Average Body Weight (kg)	0.016
Exposure Duration	1
Area Use Factor	1
Hyd. Soil/Sediment Consumption Rate (kg_{dw}/day)	0.000019
Wetland Invertebrate Consumption Rate (kg_{dw}/day)	0.0021

$$\text{Total Daily Dose} = \frac{\Sigma([IR_f \times C_f] + [IR_S \times C_S] + [IR_W \times C_W] \times ED \times AUF}{\text{Average Body Weight (kg)}}$$

Where:
IR_f = Ingestion rate of food (kg/day)
IR_s = Incidental ingestion rate of sediment or soil (kg/day)
IR_w = Drinking water ingestion rate(L/day)
C_f = Concentration of COPC in food (mg/kg)
C_s= Concentration of COPC in sediment or soil (mg/kg)
C_w= Concentration of COPC in water(mg/L)
ED = Exposure duration (fraction of time receptor spends within exposure area)

Notes:
COPC - Chemical of Potential Concern.
dw - Dry Weight.
EPC - Exposure Point Concentration.
HQ - Hazard Quotient (Dose/TRV).
LOAEL - Lowest Observed Adverse Effects Level.
NOAEL - No Observed Adverse Effects Level.
TRV - Toxicity Reference Value.
HQs above 1 are bolded and highlighted.
Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean (Attachment G-3).
Area Use Factor set at 1. Exposure area size of 7.6 acres is larger than receptor home range shown in Table 1.

SUPPORTING CALCULATIONS

FOOD WEB MODEL - MAXIMUM EPCs	Media Concentrations		Potential Daily Dose (mg/kg_{BW}/day)						
COPC	Soil / Hydric Soil / Tidal Stream Sediment (mg/kg_{dw})	Wetland Invertebrate (mg/kg_{dw})	Soil / Hydric Soil / Tidal Stream Sediment	Wetland Invertebrate	Total	NOAEL-based TRV (mg/kg_{bw}/day)	NOAEL-based HQ	LOAEL-based TRV (mg/kg_{bw}/day)	LOAEL-based HQ
Inorganics									
COPPER	2.4E+01	3.8E+01	2.9E-02	5.0E+00	5.0E+00	5.6E+00	8.9E-01	8.3E+01	6.0E-02
LEAD	9.4E+01	6.7E+00	1.1E-01	8.7E-01	9.8E-01	4.7E+00	2.1E-01	1.9E+02	5.3E-03
MERCURY	9.4E-02	1.1E-01	1.1E-04	1.4E-02	1.4E-02	3.2E-02	4.4E-01	1.6E-01	8.8E-02
NICKEL	1.4E+01	6.8E+00	1.6E-02	8.9E-01	9.1E-01	1.7E+00	5.3E-01	1.5E+01	6.1E-02
SELENIUM	1.5E+00	1.5E+00	1.7E-03	1.9E-01	1.9E-01	1.4E-01	**1.3E+00**	6.6E-01	2.9E-01
Organics									
TOTAL PCB AROCLORS	7.9E-01	8.4E-01	9.3E-04	1.1E-01	1.1E-01	6.8E-02	**1.6E+00**	6.8E-01	1.6E-01

ATTACHMENT G-5 TABLE 9
SUMMARY OF REFINED FOOD WEB HQs IN THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	NOAEL-based HQs - Maximum EPCs			
COPC	**Marsh Wren**	**Meadow Vole**	**Raccoon**	**Short-tailed Shrew**
Inorganics				
COPPER	**2.5E+00**	3.0E-01	6.3E-04	8.9E-01
LEAD	**1.2E+00**	2.3E-01	3.9E-04	2.1E-01
MERCURY	**4.5E+00**	4.6E-01	3.9E-04	4.4E-01
NICKEL	2.8E-01	1.3E-01	4.3E-04	5.3E-01
SELENIUM	**1.4E+00**	**1.3E+00**	1.2E-03	**1.3E+00**
Organics				
TOTAL PCB AROCLORS	**1.3E+00**	3.2E-01	1.1E-03	**1.6E+00**

	LOAEL-based HQs - Maximum EPCs			
COPC	**Marsh Wren**	**Meadow Vole**	**Raccoon**	**Short-tailed Shrew**
Inorganics				
COPPER	2.9E-01	2.0E-02	4.2E-05	6.0E-02
LEAD	4.5E-02	5.7E-03	9.8E-06	5.3E-03
MERCURY	4.5E-01	9.3E-02	7.8E-05	8.8E-02
NICKEL	1.0E-01	1.5E-02	4.9E-05	6.1E-02
SELENIUM	4.8E-01	2.8E-01	2.5E-04	2.9E-01
ZINC	3.5E-01	5.4E-02	7.3E-05	9.8E-02
Organics				
TOTAL PCB AROCLORS	1.3E-01	3.2E-02	1.1E-04	1.6E-01

Notes:
Maximum EPCs represent the 95% upper confidence limit (UCL) on the arithmetic mean from the following off-Project datasets: surface soil from the off-Project Red Maple Swamp walking path, hydric surface soil from the off-Project Red Maple Swamp, and surface sediment from the off-Project tidal stream.
Potential risk is calculated using the maximum EPC and both NOAEL-and LOAEL-based TRVs.
HQs above 1 are bolded and highlighted.

COPC - Chemical of Potential Concern.
HQ - Hazard Quotient (Dose/TRV).
LMW - Low Molecular Weight.
NOAEL - No Observed Adverse Effect Level.
PCBs - Polychlorinated Biphenyls.
TRV - Toxicity Reference Value.

ATTACHMENT G-5 TABLE 10
REFERENCES CITED FOR THE OFF-PROJECT RED MAPLE SWAMP / TIDAL STREAM AREA REFINED FOOD WEB MODEL
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

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Attachment H

Sediment Toxicity Testing Report

TOXICOLOGICAL EVALUATION OF SEDIMENT SAMPLES

Blue Beach FUDS Site
Quonset Point, Rhode Island
Mabbett Purchase Order #5582

***Leptocheirus plumulosus* 28 Day Sediment Evaluation**

Prepared For:

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Report Issue Date: July 29, 2020
Assay Date: June 2020
Study 34122

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TOXICOLOGICAL EVALUATION OF SEDIMENT SAMPLES

Blue Beach FUDS Site
Quonset Point, Rhode Island
Mabbett Purchase Order #5582

Leptocheirus plumulosus 28 Day Sediment Evaluation

1.0 INTRODUCTION

This report presents the results of toxicity tests carried out on sediment samples collected from the Blue Beach FUDS site located in Quonset Point, Rhode Island. Samples were provided by Mabbett & Associates, Stoneham, Massachusetts. Biological testing was based on programs and protocols developed by the US Environmental Protection Agency, (USEPA 2001, 1994) and ASTM (2019). Potential toxicological impacts of the samples were determined by conducting 28-day toxicity tests with the estuarine amphipod, *Leptocheirus plumulosus*. All testing, toxicological and analytical, was performed at Enthalpy Analytical, LLC (Enthalpy), Hampton, New Hampshire.

Toxicity tests expose groups of organisms to environmental samples, reference sites and laboratory control samples for a specified period to assess potential impacts. Analysis of variance techniques are used to determine if differences in a measured endpoint for organisms exposed to a test sample are significantly different from responses obtained from organisms exposed to field reference sites or laboratory control samples. Endpoints evaluated as part of these assays include survival, growth and reproduction.

2.0 MATERIALS AND METHODS

2.1 General Methods, Biological Evaluations

Toxicological and analytical protocols used in this program follow procedures outlined in *Standard Test Method for Measuring the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Invertebrates* (ASTM 2019), *Methods for Assessing the Chronic Toxicity of Marine and Estuarine Sediment-associated Contaminants with the Amphipod, Leptocheirus plumulosus* (USEPA 2001), *Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods* (USEPA 1994), and *Standard Methods for the Examination of Water and Wastewater*, 22nd Edition (APHA 2012). These protocols provide standard approaches for physical and chemical analyses and for the evaluation of toxicological effects of sediments on aquatic invertebrates.

2.2 Test Species

Leptocheirus plumulosus were obtained from cultures maintained by Aquatic BioSystems, Incorported (ABS) of Fort Collins, Colorado. The organisms used in the assay were size selected from those that pass through a 600μm sieve and are retained by a 500 μm screen at the start of the test.

2.3 Test Samples

Sediment samples collected for this project were received at Enthalpy in 2-gallon polyethylene buckets under chain of custody. Once received, samples were inspected to determine integrity, given unique sample numbers and logged into the laboratory sample management database. Samples were stored in a refrigerator maintained at 4$\pm$2°C. A listing of sample sites, sample collection, and receipt information is summarized in Table 1.

Sediment for the laboratory control treatment was collected from the Hampton-Seabrook Estuary, Hampton, New Hampshire. The area is not known to receive any direct industrial inputs and has been used as laboratory control sediment in the testing of marine sediments since 1978.

Overlying seawater used in the assays is pumped in from the Hampton-Seabrook Estuary and stored in holding tanks. Seawater is obtained through a filter system located on the bottom of the estuary at a point approximately 1 mile from the open ocean. Water in the holding tanks is re-circulated, which helps to ensure proper mixing and provides aeration. Water from the estuary has been used for the culture and maintenance of test organisms at Enthalpy since 1978.

Prior to testing samples, all samples were press sieved through a 2-mm stainless steel sieve (US Standard #10 sieve) to remove large stones, sticks, roots, man-made material and indigenous organisms. Once sieved, the sediment was homogenized and placed in test chambers. Overlying water was added immediately and the chambers were allowed to stabilize. During this period, the chambers received one volume addition daily and the pore water was measured for ammonia. The published threshold for *Leptocheirus* in waters with a pH of 7.7 is <60mg/L, measured as total ammonia, and <0.8mg/L, measured as unionized ammonia. Once the pore water ammonia was sufficiently below these levels, the assay proceeded.

2.4 *L. plumulosus* 28 Day Sediment Evaluation Methods

The 28-day amphipod sediment tests were conducted according to the methods provided in the ASTM (2019) and USEPA (2001, 1994). Endpoints measured at the completion of the assays were survival, growth and reproduction. Growth was measured as dry weight and dry biomass. Reproduction was measured as juvenile production per surviving amphipod and juvenile production per surviving female amphipod.

Test vessels were 1000 mL glass beakers containing approximately 175 mL of sediment and approximately 725 mL of overlying water. Test vessels were drilled at a consistent height, approximately 3 cm below the lip, and the drilled hole covered with nylon screen to facilitate water exchange without the loss of test organisms. Vessels were maintained in a water bath during the test. Depth of the water in the bath was set below the drain hole in the test vessel to eliminate flow of water from the bath into the test vessel. Test chambers were block randomized by replicate and placed in the water bath after addition of test sediments. Placement locations were generated by the CETIS™ v1.9.6.3 software program. The randomization order is included in Appendix A. The water bath was maintained in a limited access, temperature controlled room. Temperatures in the room and water bath were independently set at a temperature of 25°C. Temperature was recorded on an hourly frequency using a temperature logger placed in a surrogate vessel. The photoperiod in the test chamber was set at 16:8 hour light:dark. Lighting was supplied by cool white fluorescent and/or LED bulbs.

Each treatment group included 8 replicates with 20 randomly selected organisms per replicate, as well as a surrogate test chamber. The surrogate chamber was used to obtain water qualities during the assay without disturbing the test animals, and were treated the same as actual test chambers with the addition of animals and food but were not used to determine endpoint data.

Each day during the test, chambers received 1 volume of new seawater having similar salinity and temperature as the overlying water in the vessels. Water exchanges were facilitated by use of a distribution system designed to provide equal and regulated flow to each chamber. The system was activated manually by the addition of water during the test. Overlying water dissolved oxygen, pH, salinity, specific conductivity and temperature were measured daily in a surrogate chamber for each treatment. Test chambers were aerated in order to maintain dissolved oxygen levels at ≥60% saturation. Water quality measurements were completed prior to overlying water renewals. The total ammonia concentration of the overlying and pore water was measured on days 0, 7, 14, 21 and 28. In order to calculate the unionized ammonia levels in the pore water, the temperature, pH and salinity were also measured.

Test chambers were observed daily and any organisms found floating on the surface were noted on

the data sheets. Organisms were fed three times weekly with a 20 mg/mL suspension of flake fish food, dried alfalfa leaves, wheat grass powder and shrimp maturation feed. During the first 2 weeks of the assay, amphipods in each replicate were fed 1mL of the suspension at each feeding. The amount of food was increased to 2mL for the last 2 weeks of the assay.

After the 28 days exposure, organisms were recovered from the sediments. Each test chamber was gently swirled to loosen the sediments and the test material was dumped into stacked 8" stainless steel sieves with 710 and 355 μm mesh (US Standard #25 and #45) sieves. The sediments were washed through the sieve using water and material left on the screen was sorted to recover all amphipods. This process was continued until the entire sample was evaluated. Juvenile *L. plumulosus* were discarded once they were counted. Adult *L. plumulosus* were differentiated from juveniles following sieving (adults are retained on the larger top sieve) and based on a visual inspection of size. Adult organisms were preserved with formalin solution and sexed. Adults were then placed on tared weighing pans and dried overnight at $104 \pm 6^{\circ}$C to obtain dry weight to the nearest 0.01 mg. The mean weight of surviving adult organisms was determined to assess growth.

2.5 Statistical Analysis

Survival, growth and reproduction data were analyzed using CETIS™ v. 1.9.6.3 software to determine significant differences between the test sediments and the associated laboratory control and reference locations. Data sets were evaluated to determine normality of distribution and homogeneity of sample variance. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistic. If outliers were found in the data set, then the analysis was conducted both with and without the outlier included in the data set. Statistical comparisons were made for the following endpoints: survival, dry weight, dry biomass, juvenile production per surviving amphipod (CETIS endpoint “reproduction”) and juvenile production per surviving female. Pair-wise comparisons were made using the appropriate statistical evaluation. Statistical difference was evaluated at $\alpha = 0.05$.

2.6 Reference Toxicant Evaluation

As part of the laboratory quality control program, reference toxicant evaluations are conducted by Enthalpy on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. Results are summarized in Table 2.

3.0 RESULTS AND DISCUSSION

Table 3 provides a summary of assay acceptability criteria and laboratory control achievement, and Table 4 provides a summary of exposure conditions. Table 5 summarizes the endpoint performances for each reference site. Tables 6 through 11 summarize assay endpoints and detailed statistical results for individual endpoints, and Table 12 summarizes the findings of significant effects on amphipods for all endpoints. Tables 13 and 14 summarize ammonia data in overlying water and pore water, respectively.

3.1 Laboratory Control Performance

Following the 28-day exposure period, mean amphipod survival in the laboratory control sediment was 91%, had a coefficient of variation (CV) of 14% and a minimum inter-replicate survival rate of 60%. Test acceptability criteria require ≥80% survival on day 28 with no individual replicate having <60% survival. The mean dry weight of surviving amphipods at the end of the assay was 1.07 mg/organism. The mean dry weight of 40 randomly selected amphipods at the start of the assay was 0.253 mg/organism. The overall mean juvenile production was calculated to be 2.4 juveniles/surviving amphipod. Protocol requires that organisms must show some evidence of growth and reproduction (ASTM, USEPA). Based on the data, the amphipods are considered healthy and the overlying water was determined to have had no adverse impact on the outcome of the assay.

Mean reference site survival ranged from 56% (Sed-325) to 86% (Sed-324), and all reference site samples showed evidence of growth and reproduction.

3.2 Water Quality Data

Tables 4, 13 and 14 summarize water quality data collected during the assay. Temperature data collected during the daily water quality observations documented a mean value of 24.8°C with a range of 20.0 to 26.1°C. Confirmation temperature data collected on an hourly basis from a data logger documented a mean value of 23.8°C with a range of 19.7 to 25.6°C. Salinity levels ranged from 17.8 to 22.0‰ with a mean value of 20.5‰. Dissolved oxygen ranged from 55% to 97%. Target exposure conditions are a mean temperature of 25±1°C with maximum temporary fluctuations of 25±3°C, salinity within a range of 20±2‰ and dissolved oxygen ≥60%. See Section 3.3.2 for a discussion of the temperature and dissolved oxygen excursions.

3.3 Protocol Deviations and Exposure Condition Excursions

3.3.1 Protocol Deviations

Review of data generated during the 28-day exposure period revealed one deviation from the method protocol or Enthalpy's SOP. There were a few instances (replicate 2 of Sed-339 and replicate 6 of Sed-333) in which 21 adult amphipods were found in a test chamber at assay termination, therefore the same number were presumed to have been added at the start of the assay for purposes of the statistical analyses. This is a reasonable assumption as technicians are checked for their ability to count live organisms and the staff on hand have documented a high degree of counting accuracy. Despite this, counting errors can occur. These impacts are mitigated by the test design. Testing incorporated 8 replicates for each sample, thereby reducing the impact of a single replicate on the overall assessment. It is the opinion of Enthalpy's study director that this deviation did not adversely affect the outcome of the assay.

3.3.2 Exposure Condition Excursions

Review of data generated during the 28-day exposure period revealed that temperature readings recorded by the hourly temperature logger dropped below Enthalpy's standard protocol range of 25±3°C for a period of 22 hours, from 11:53:16 AM on June 30th to 9:53:16 AM on July 1st (days 13 and 14 of the assay). The hourly temperatures dropped to a low of 19.7°C, and daily readings confirmed that temperatures fell below the target range in all treatments on day 14. The low readings were the result of a short circuit in the power connection, causing the GFC protection to trip and the water bath pump to turn off. The problem was fixed upon discovery the next morning, the pump was turned back on and temperatures climbed back into the target range. These values are still within the normal temperature range tolerated by *L. plumulosus*, and the mean temperature fell within the target range indicating that overall, the exposure condition objectives were achieved. It is the opinion of Enthalpy's technical director that this excursion had no adverse impact on the result of the assay.

A single dissolved oxygen measurement recorded in Sed-331 on June 25th (day 8 of the assay) fell slightly below the target lower threshold of 60% identified in Enthalpy's SOP. Nearly all of the remaining measurements were upwards of 80%. There was a notation on the daily record on day 8 indicating that an airline had fallen out of that sample and was put back into the water upon discovery. This isolated excursion had no adverse impact on the results of the assay.

4.0 SUMMARY

This program utilized protocols developed by the USEPA and ASTM to assess the potential toxicological impacts that exposure to sediments from the Blue Beach FUDS site would have on aquatic invertebrates. The results of the statistical analyses indicate that there was a pattern of significant adverse effects on amphipods following exposure to site samples Sed-331, Sed-335 and Sed-339 as compared to the laboratory control and most reference sites (all except reference sample Sed-321). Survival was significantly impacted in only one site sample (Sed-335), however all 3 samples had significant negative effects on amphipod growth and reproduction. There were no significant effects on amphipods following exposure to site samples Sed-333 or Sed-337 for any of the endpoints measured.

5.0 LITERATURE CITED

APHA. 2012. *Standard Methods for the Examination of Water and Wastewater*, 22nd edition. Washington D.C.

ASTM. 2019. *Standard Test Method for Measuring the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Invertebrates*. Method E 1367-03, re-approved 2008. ASTM Annual Book of Standards, Volume 11.06.

USEPA. 1994. *Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods*. EPA 600/R-94/025.

USEPA. 2001. *Methods for Assessing the Chronic Toxicity of Marine and Estuarine Sediment- Associated Contaminants with the Amphipod, Leptocheirus plumulosus.* EPA 600/R-01/020.

Table 1. Sample Collection and Receipt Summary.
Blue Beach FUDS Site. June 2020.

Field ID	Lab Code	Purpose	Sample Type	Sample Collected Date	Sample Collected Time	Sample Received Date	Sample Received Time
Sed-321-C120-0-0.5	34122-001	Reference	Solid	05/28/20	1155	05/29/20	1050
Sed-322-C120-0-0.5	34122-002	Reference	Solid	05/28/20	1205	05/29/20	1050
Sed-323-C120-0-0.5	34122-003	Reference	Solid	05/28/20	1215	05/29/20	1050
Sed-324-C120-0-0.5	34122-004	Reference	Solid	05/28/20	1225	05/29/20	1050
Sed-325-C120-0-0.5	34122-005	Reference	Solid	05/28/20	1235	05/29/20	1050
Sed-331-C120-0-0.5	34122-006	Site	Solid	05/28/20	1100	05/29/20	1050
Sed-333-C120-0-0.5	34122-007	Site	Solid	05/28/20	1025	05/29/20	1050
Sed-335-C120-0-0.5	34122-008	Site	Solid	05/28/20	1010	05/29/20	1050
Sed-337-C120-0-0.5	34122-009	Site	Solid	05/28/20	0955	05/29/20	1050
Sed-339-C120-0-0.5	34122-010	Site	Solid	05/28/20	0940	05/29/20	1050

Table 2. Reference Toxicant Evaluation.
Blue Beach FUDS Site. June 2020.

Date	Organism Lot	Endpoint	Value	Historic Mean	Acceptable Range	Reference Toxicant
Leptocheirus plumulosus						
06/30/20	99LpABS063020	Survival: 96Hr LC-50	133	158	59 – 258	Ammonia (mg/L)

Table 3. Assay Acceptability and Laboratory Control Performance.
Blue Beach FUDS Site. June 2020.

Endpoint / Measurement	Protocol Criteria	Unit of Measure	Laboratory Control
Survival	Lab mean ≥ 80% No replicates <60%	Mean % Survival	91%
		Minimum % Survival	60%
		Protocol Met	Yes
Growth	Measured Growth (mg/)	Start Dry Wt.	0.253
		End Dry Wt.	1.07
		Protocol Met	Yes
Reproduction	Juvenile Production	Juveniles per Adult	2.4
		Protocol Met	Yes

Table 4. Exposure Conditions.
Blue Beach FUDS Site. June 2020.

Exposure Conditions	Target	Unit of Measure	*L. plumulosus*
Temperature	Mean: 25±1°C	Daily / Hourly	24.8 / 23.8 [a]
	Minimum: 22°C	Daily / Hourly	20.0 [b] / 19.7 [b]
	Maximum: 28°C	Daily / Hourly	26.1 / 25.6
		Protocol Met	No [b] / No [b]
Salinity	Mean: 20±2‰	Mean	20.5
	Minimum: 17‰	Minimum	17.8
	Maximum: 23‰	Maximum	22.0
		Protocol Met	Yes
Dissolved Oxygen	Minimum: 60%	Minimum	55%
		Protocol Met	No [b]

Notes:
[a] The value meets the target exposure condition when rounded to the whole number precision reflected in the protocol.
[b] Refer to Section 3.3.2 for a discussion of the excursion.

Table 5. Project Reference Site Performance.
Blue Beach FUDS Site. June 2020.

		Survival	Growth		Reproduction	
Field ID	Sample Number	Percent (%)	Dry Weight (mg)	Dry Biomass (mg)	Juveniles per Amphipod [a]	Juveniles per Female [b]
Sed-321-C120-0-0.5	001	73%	0.746	0.617	0.61	1.7
Sed-322-C120-0-0.5	002	73%	0.799	0.695	1.1	2.5
Sed-323-C120-0-0.5	003	74%	0.963	0.707	0.93	1.6
Sed-324-C120-0-0.5	004	86%	0.924	0.84	1.3	3.3
Sed-325-C120-0-0.5	005	56%	0.932	0.838	1.4	3.9

Notes:
[a] Juveniles per Amphipod is the same as CETIS endpoint “Reproduction”.
[b] Juveniles per Female is the same as CETIS endpoint “Offspring/Surviving Female”.

Table 6. Survival Summary and Statistical Analysis. Blue Beach FUDS Site. June 2020.

Survival Summary

Field ID	Lab Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	34122-000	8	91%	60%	100%	14%
Sed-321-C120-0-0.5	34122-001	8	73%	0%	100%	60%
Sed-322-C120-0-0.5	34122-002	8	73%	0%	100%	47%
Sed-323-C120-0-0.5	34122-003	8	74%	0%	100%	58%
Sed-324-C120-0-0.5	34122-004	8	86%	25%	100%	29%
Sed-325-C120-0-0.5	34122-005	8	56%	0%	100%	83%
Sed-331-C120-0-0.5	34122-006	8	93%	85%	100%	6%
Sed-333-C120-0-0.5	34122-007	8	95%	65%	100%	13%
Sed-335-C120-0-0.5	34122-008	8	61%	40%	85%	30%
Sed-337-C120-0-0.5	34122-009	8	96%	80%	100%	8%
Sed-339-C120-0-0.5	34122-010	8	93%	85%	100%	7%

Survival Statistical Analysis

		Statistically Significant Difference as Compared to:					
Field ID	Lab Code	Lab Control (000)	Sed-321 (001)	Sed-322 (002)	Sed-323 (003)	Sed-324 (004)	Sed-325 (005)
Sed-321-C120-0-0.5	34122-001	No	-	-	-	-	-
Sed-322-C120-0-0.5	34122-002	No/No	-	-	-	-	-
Sed-323-C120-0-0.5	34122-003	No	-	-	-	-	-
Sed-324-C120-0-0.5	34122-004	No/No	-	-	-	-	-
Sed-325-C120-0-0.5	34122-005	Yes	-	-	-	-	-
Sed-331-C120-0-0.5	34122-006	No/No	No	No/No	No	No/No	No
Sed-333-C120-0-0.5	34122-007	No	No	No/No	No	No/No	No
Sed-335-C120-0-0.5	34122-008	Yes	No	No/Yes [a]	Yes	Yes/Yes	No
Sed-337-C120-0-0.5	34122-009	No/No	No	No/No	No	No/No	No
Sed-339-C120-0-0.5	34122-010	No/No	No	No/No	No	No/No	No

Note:
[a] Analysis was conducted with the exclusion of a statistical outlier.
No/No and Yes/Yes indicate that there was no difference in outcome when an outlier was excluded from the statistical analysis (refer to Appendix A).

Table 7. Dry Weight (mg) Summary and Statistical Analysis. Blue Beach FUDS Site. June 2020.

Dry Weight Summary

Field ID	Lab Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	34122-000	8	1.07	0.846	1.38	16%
Sed-321-C120-0-0.5	34122-001	7	0.746	0.451	1.04	29%
Sed-322-C120-0-0.5	34122-002	7	0.799	0.388	1.03	26%
Sed-323-C120-0-0.5	34122-003	7	0.963	0.494	1.85	46%
Sed-324-C120-0-0.5	34122-004	8	0.924	0.294	1.22	35%
Sed-325-C120-0-0.5	34122-005	5	0.932	0.743	1.07	14%
Sed-331-C120-0-0.5	34122-006	8	0.749	0.362	1.12	32%
Sed-333-C120-0-0.5	34122-007	8	0.973	0.627	1.18	18%
Sed-335-C120-0-0.5	34122-008	8	0.731	0.551	1.04	20%
Sed-337-C120-0-0.5	34122-009	8	1.48	0.938	1.98	25%
Sed-339-C120-0-0.5	34122-010	8	0.672	0.603	0.765	9%

Dry Weight Statistical Analysis

		Statistically Significant Difference as Compared to:					
Field ID	Lab Code	Lab Control (000)	Sed-321 (001)	Sed-322 (002)	Sed-323 (003)	Sed-324 (004)	Sed-325 (005)
Sed-321-C120-0-0.5	34122-001	Yes	-	-	-	-	-
Sed-322-C120-0-0.5	34122-002	Yes	-	-	-	-	-
Sed-323-C120-0-0.5	34122-003	No/Yes [a]	-	-	-	-	-
Sed-324-C120-0-0.5	34122-004	No	-	-	-	-	-
Sed-325-C120-0-0.5	34122-005	No	-	-	-	-	-
Sed-331-C120-0-0.5	34122-006	Yes	No	No	No/No	No	No
Sed-333-C120-0-0.5	34122-007	No	No	No	No/No	No	No
Sed-335-C120-0-0.5	34122-008	Yes	No	No	No/No	No	Yes
Sed-337-C120-0-0.5	34122-009	No	No	No	No	No	No
Sed-339-C120-0-0.5	34122-010	Yes	No	No/Yes [a]	Yes/No [a]	Yes/Yes	Yes

Note:
[a] Analysis was conducted with the exclusion of a statistical outlier.
No/No and Yes/Yes indicate that there was no difference in outcome when an outlier was excluded from the statistical analysis (refer to Appendix A).

Table 8. Dry Biomass (mg) Summary and Statistical Analysis. Blue Beach FUDS Site. June 2020.

Dry Biomass Summary

Field ID	Lab Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	34122-000	8	0.972	0.507	1.24	24%
Sed-321-C120-0-0.5	34122-001	7	0.617	0.04	1.04	55%
Sed-322-C120-0-0.5	34122-002	7	0.695	0.175	1.03	38%
Sed-323-C120-0-0.5	34122-003	7	0.707	0.185	1.14	45%
Sed-324-C120-0-0.5	34122-004	8	0.84	0.0735	1.1	42%
Sed-325-C120-0-0.5	34122-005	5	0.838	0.632	1.02	16%
Sed-331-C120-0-0.5	34122-006	8	0.696	0.308	1.01	33%
Sed-333-C120-0-0.5	34122-007	8	0.94	0.407	1.18	26%
Sed-335-C120-0-0.5	34122-008	8	0.447	0.275	0.725	39%
Sed-337-C120-0-0.5	34122-009	8	1.41	0.844	1.93	24%
Sed-339-C120-0-0.5	34122-010	8	0.626	0.543	0.765	11%

Dry Biomass Statistical Analysis

		Statistically Significant Difference as Compared to:					
Field ID	Lab Code	Lab Control (000)	Sed-321 (001)	Sed-322 (002)	Sed-323 (003)	Sed-324 (004)	Sed-325 (005)
Sed-321-C120-0-0.5	34122-001	Yes	-	-	-	-	-
Sed-322-C120-0-0.5	34122-002	Yes	-	-	-	-	-
Sed-323-C120-0-0.5	34122-003	Yes	-	-	-	-	-
Sed-324-C120-0-0.5	34122-004	No/No	-	-	-	-	-
Sed-325-C120-0-0.5	34122-005	No	-	-	-	-	-
Sed-331-C120-0-0.5	34122-006	Yes	No	No	No	No/Yes [a]	No
Sed-333-C120-0-0.5	34122-007	No	No	No	No	No/No	No/No
Sed-335-C120-0-0.5	34122-008	Yes	No	Yes	Yes	Yes/Yes	Yes
Sed-337-C120-0-0.5	34122-009	No	No	No	No	No	No
Sed-339-C120-0-0.5	34122-010	Yes/Yes	No	No/Yes [a]	No	Yes/Yes	Yes

Note:
[a] Analysis was conducted with the exclusion of a statistical outlier.
No/No and Yes/Yes indicate that there was no difference in outcome when an outlier was excluded from the statistical analysis (refer to Appendix A).

Table 9. Juvenile Production per Surviving Amphipod Summary and Statistical Analysis. Blue Beach FUDS Site. June 2020.

Juvenile Production per Surviving Amphipod Summary

Field ID	Lab Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	34122-000	8	2.4	0.3	4.1	52%
Sed-321-C120-0-0.5	34122-001	7	0.61	0.1	1.7	92%
Sed-322-C120-0-0.5	34122-002	7	1.1	0	2.4	75%
Sed-323-C120-0-0.5	34122-003	7	0.93	0	2.1	92%
Sed-324-C120-0-0.5	34122-004	8	1.3	0	2.7	77%
Sed-325-C120-0-0.5	34122-005	5	1.4	0.75	1.7	29%
Sed-331-C120-0-0.5	34122-006	8	0.38	0	0.7	69%
Sed-333-C120-0-0.5	34122-007	8	1.9	0	4.2	69%
Sed-335-C120-0-0.5	34122-008	8	0.27	0	1.1	142%
Sed-337-C120-0-0.5	34122-009	8	3.8	1.2	7.8	59%
Sed-339-C120-0-0.5	34122-010	8	0.34	0	0.95	89%

Juvenile Production per Surviving Amphipod Statistical Analysis

		Statistically Significant Difference as Compared to:					
Field ID	Lab Code	Lab Control (000)	Sed-321 (001)	Sed-322 (002)	Sed-323 (003)	Sed-324 (004)	Sed-325 (005)
Sed-321-C120-0-0.5	34122-001	Yes	-	-	-	-	-
Sed-322-C120-0-0.5	34122-002	Yes	-	-	-	-	-
Sed-323-C120-0-0.5	34122-003	Yes	-	-	-	-	-
Sed-324-C120-0-0.5	34122-004	Yes	-	-	-	-	-
Sed-325-C120-0-0.5	34122-005	No	-	-	-	-	-
Sed-331-C120-0-0.5	34122-006	Yes	No/No	Yes	No	Yes	Yes
Sed-333-C120-0-0.5	34122-007	No	No	No	No	No	No
Sed-335-C120-0-0.5	34122-008	Yes	No	Yes	Yes	Yes	Yes
Sed-337-C120-0-0.5	34122-009	No	No	No	No	No	No
Sed-339-C120-0-0.5	34122-010	Yes	No	Yes	Yes	Yes	Yes

Note:
No/No indicates that there was no difference in outcome when an outlier was excluded from the statistical analysis (refer to Appendix A).

Table 10. Juvenile Production per Female Amphipod Summary and Statistical Analysis. Blue Beach FUDS Site. June 2020.

Juvenile Production per Female Amphipod Summary

Field ID	Lab Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	34122-000	8	5.0	0.86	7.4	47%
Sed-321-C120-0-0.5	34122-001	7	1.7	0.39	4.7	90%
Sed-322-C120-0-0.5	34122-002	7	2.5	0	6.7	86%
Sed-323-C120-0-0.5	34122-003	7	1.6	0	3.2	93%
Sed-324-C120-0-0.5	34122-004	8	3.3	0	7.7	77%
Sed-325-C120-0-0.5	34122-005	5	3.9	1.1	8.5	79%
Sed-331-C120-0-0.5	34122-006	8	0.80	0	1.9	87%
Sed-333-C120-0-0.5	34122-007	8	3.6	0	9.2	80%
Sed-335-C120-0-0.5	34122-008	8	0.67	0	2.8	138%
Sed-337-C120-0-0.5	34122-009	8	7.7	2.4	14.2	53%
Sed-339-C120-0-0.5	34122-010	8	0.83	0	2.7	110%

Juvenile Production per Female Amphipod Statistical Analysis

		Statistically Significant Difference as Compared to:					
Field ID	Lab Code	Lab Control (000)	Sed-321 (001)	Sed-322 (002)	Sed-323 (003)	Sed-324 (004)	Sed-325 (005)
Sed-321-C120-0-0.5	34122-001	Yes	-	-	-	-	-
Sed-322-C120-0-0.5	34122-002	Yes	-	-	-	-	-
Sed-323-C120-0-0.5	34122-003	Yes	-	-	-	-	-
Sed-324-C120-0-0.5	34122-004	No	-	-	-	-	-
Sed-325-C120-0-0.5	34122-005	No	-	-	-	-	-
Sed-331-C120-0-0.5	34122-006	Yes	No/No	Yes/Yes	No	Yes	Yes
Sed-333-C120-0-0.5	34122-007	No	No	No	No	No	No
Sed-335-C120-0-0.5	34122-008	Yes	Yes/No [a]	Yes/Yes	No	Yes	Yes
Sed-337-C120-0-0.5	34122-009	No	No	No	No	No	No
Sed-339-C120-0-0.5	34122-010	Yes	No/No	Yes/No [a]	No	Yes	Yes

Note:
[a] Analysis was conducted with the exclusion of a statistical outlier.
No/No and Yes/Yes indicate that there was no difference in outcome when an outlier was excluded from the statistical analysis (refer to Appendix A).

Table 11. Summary of Statistically Significant Endpoints.
Blue Beach FUDS Site. June 2020.

		Lab Control (000)					Sed-321 (001)					Sed-322 (002)					Sed-323 (003)					Sed-324 (004)					Sed-325 (005)				
		Survival	Growth		Juveniles produced per		Survival	Growth		Juveniles produced per		Survival	Growth		Juveniles produced per		Survival	Growth		Juveniles produced per		Survival	Growth		Juveniles produced per		Survival	Growth		Juveniles produced per	
Field ID	Sample Number		DWt	Bio	♂♀	♀		DWt	Bio	♂♀	♀		DWt	Bio	♂♀	♀		DWt	Bio	♂♀	♀		DWt	Bio	♂♀	♀		DWt	Bio	♂♀	♀
Sed-321-C120-0-0.5	001		Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sed-322-C120-0-0.5	002		Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sed-323-C120-0-0.5	003		Y *	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sed-324-C120-0-0.5	004				Y		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sed-325-C120-0-0.5	005	Y					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sed-331-C120-0-0.5	006		Y	Y	Y	Y									Y	Y								Y *	Y	Y				Y	Y
Sed-333-C120-0-0.5	007																														
Sed-335-C120-0-0.5	008	Y	Y	Y	Y	Y					Y *	Y *		Y	Y	Y	Y		Y	Y		Y		Y	Y	Y		Y	Y	Y	Y
Sed-337-C120-0-0.5	009																														
Sed-339-C120-0-0.5	010		Y	Y	Y	Y							Y *	Y *	Y	Y *		Y *		Y			Y	Y	Y	Y		Y	Y	Y	Y

Note: Data were analyzed to determine significant differences between test sediments, reference sediments, and the laboratory control. Statistical difference was evaluated at α=0.05.

- "Y" Indicates that a statistical difference was identified.
- "-" Indicates that statistical analysis was not conducted.
- " " An empty cell indicates that a statistical difference was not found.
- "*" Indicates that the analysis was completed both with and without a statistical outlier and the findings were split (Yes and No).

Table 12. Ammonia Data: Overlying Water.
Blue Beach FUDS Site. June 2020.

Field ID	Sample Number	Day	Total Ammonia (mg/L)	Unionized Ammonia (mg/L)	Temp (°C)	pH (SU)	Salinity (‰)
Laboratory Control	000	00	<0.1	<0.0030	25.5	7.76	20.64
Sed-321-C120-0-0.5	001	00	1.59	0.0282	25.5	7.53	20.64
Sed-322-C120-0-0.5	002	00	1.98	0.0281	25.5	7.43	20.45
Sed-323-C120-0-0.5	003	00	1.21	0.0136	25.5	7.33	20.90
Sed-324-C120-0-0.5	004	00	1.98	0.0220	25.6	7.32	20.67
Sed-325-C120-0-0.5	005	00	0.88	0.0120	25.6	7.41	20.81
Sed-331-C120-0-0.5	006	00	0.34	0.0052	25.5	7.46	20.32
Sed-333-C120-0-0.5	007	00	0.23	0.0041	25.4	7.53	20.72
Sed-335-C120-0-0.5	008	00	0.17	0.0050	25.5	7.75	20.54
Sed-337-C120-0-0.5	009	00	0.7	0.0255	25.5	7.85	20.47
Sed-339-C120-0-0.5	010	00	<0.1	<0.0038	25.5	7.87	20.49
Laboratory Control	000	07	0.32	0.0018	25.2	7.04	20.15
Sed-321-C120-0-0.5	001	07	1.14	0.0081	25.1	7.14	20.12
Sed-322-C120-0-0.5	002	07	0.84	0.0060	25.1	7.14	20.41
Sed-323-C120-0-0.5	003	07	0.3	0.0025	25.2	7.20	20.10
Sed-324-C120-0-0.5	004	07	0.7	0.0087	25.2	7.38	20.28
Sed-325-C120-0-0.5	005	07	0.49	0.0082	25.3	7.51	20.25
Sed-331-C120-0-0.5	006	07	0.54	0.0083	25.1	7.48	20.27
Sed-333-C120-0-0.5	007	07	0.62	0.0103	25.2	7.51	20.41
Sed-335-C120-0-0.5	008	07	0.41	0.0087	25.2	7.62	20.29
Sed-337-C120-0-0.5	009	07	0.65	0.0155	25.2	7.67	20.25
Sed-339-C120-0-0.5	010	07	0.15	0.0038	25.2	7.70	20.25
Laboratory Control	000	14	0.18	0.0004	20.2	6.82	20.14
Sed-321-C120-0-0.5	001	14	0.23	0.0011	20.3	7.13	20.15
Sed-322-C120-0-0.5	002	14	0.2	0.0010	20.2	7.15	20.31
Sed-323-C120-0-0.5	003	14	0.24	0.0014	20.3	7.21	20.09
Sed-324-C120-0-0.5	004	14	0.29	0.0025	20.3	7.38	20.23
Sed-325-C120-0-0.5	005	14	0.2	0.0022	20.3	7.48	19.62
Sed-331-C120-0-0.5	006	14	0.3	0.0033	20.3	7.48	19.49
Sed-333-C120-0-0.5	007	14	0.26	0.0032	20.3	7.54	20.12
Sed-335-C120-0-0.5	008	14	0.23	0.0029	20.2	7.55	19.69
Sed-337-C120-0-0.5	009	14	0.88	0.0111	20.1	7.55	19.69
Sed-339-C120-0-0.5	010	14	0.19	0.0027	20.0	7.60	18.88
Laboratory Control	000	21	0.2	0.0013	24.9	7.11	20.56
Sed-321-C120-0-0.5	001	21	<0.1	<0.0009	24.8	7.24	20.49
Sed-322-C120-0-0.5	002	21	0.16	0.0014	24.8	7.23	20.56
Sed-323-C120-0-0.5	003	21	<0.1	<0.0013	24.8	7.41	20.53

Field ID	Sample Number	Day	Total Ammonia (mg/L)	Unionized Ammonia (mg/L)	Temp (°C)	pH (SU)	Salinity (‰)
Sed-324-C120-0-0.5	004	21	0.12	0.0019	24.8	7.50	20.60
Sed-325-C120-0-0.5	005	21	0.12	0.0024	24.8	7.60	20.63
Sed-331-C120-0-0.5	006	21	0.15	0.0026	24.7	7.55	20.56
Sed-333-C120-0-0.5	007	21	0.13	0.0025	24.8	7.58	20.65
Sed-335-C120-0-0.5	008	21	0.26	0.0052	24.7	7.61	20.50
Sed-337-C120-0-0.5	009	21	0.34	0.0064	24.7	7.58	20.62
Sed-339-C120-0-0.5	010	21	<0.1	<0.0023	24.8	7.66	19.34
Laboratory Control	000	28	0.34	0.0022	24.8	7.12	21.51
Sed-321-C120-0-0.5	001	28	0.2	0.0017	24.8	7.24	21.32
Sed-322-C120-0-0.5	002	28	0.15	0.0012	24.7	7.22	21.47
Sed-323-C120-0-0.5	003	28	0.18	0.0019	24.7	7.32	21.24
Sed-324-C120-0-0.5	004	28	0.14	0.0019	24.8	7.43	21.41
Sed-325-C120-0-0.5	005	28	0.16	0.0025	24.8	7.50	21.26
Sed-331-C120-0-0.5	006	28	0.12	0.0017	24.7	7.47	21.15
Sed-333-C120-0-0.5	007	28	0.17	0.0026	24.6	7.49	21.15
Sed-335-C120-0-0.5	008	28	0.45	0.0076	24.6	7.54	21.20
Sed-337-C120-0-0.5	009	28	0.29	0.0042	24.6	7.47	21.23
Sed-339-C120-0-0.5	010	28	0.12	0.0020	24.7	7.52	21.19

Note: Additional water quality and analytical support data provided in Appendix A.
The published threshold for *Leptocheirus* in waters with a pH of 7.7 is <60mg/L measured as total ammonia and <0.8mg/L measured as unionized ammonia.

Table 13. Ammonia Data: Pore Water.
Blue Beach FUDS Site. June 2020.

Field ID	Sample Number	Day	Total Ammonia (mg/L)	Unionized Ammonia (mg/L)	Temp (°C)	pH (SU)	Salinity (‰)
Pre-Assay Data							
Laboratory Control	000	-06	1.7	0.0029	19.0	6.72	22.0
Sed-321-C120-0-0.5	001	-06	4.24	0.0045	19.4	6.49	18.7
Sed-322-C120-0-0.5	002	-06	2.33	0.0032	19.1	6.62	19.3
Sed-323-C120-0-0.5	003	-06	6.6	0.0064	19.3	6.45	16.9
Sed-324-C120-0-0.5	004	-06	4.76	0.0031	19.2	6.28	18.4
Sed-325-C120-0-0.5	005	-06	2.75	0.0013	19.3	6.13	18.5
Sed-331-C120-0-0.5	006	-06	3.82	0.0035	19.4	6.40	5.9
Sed-333-C120-0-0.5	007	-06	3.48	0.0187	19.4	7.20	18.9
Sed-335-C120-0-0.5	008	-06	3.86	0.0220	19.5	7.22	18.1
Sed-337-C120-0-0.5	009	-06	9.36	0.0410	19.5	7.11	20.2
Sed-339-C120-0-0.5	010	-06	0.2	0.0021	19.2	7.51	19.6
In-Life Assay Data							
Laboratory Control	000	00	1.58	0.0036	22.0	6.75	20.9
Sed-321-C120-0-0.5	001	00	3.86	0.0041	22.0	6.41	20.0
Sed-322-C120-0-0.5	002	00	4.45	0.0050	22.1	6.43	19.6
Sed-323-C120-0-0.5	003	00	3.3	0.0034	21.9	6.40	19.8
Sed-324-C120-0-0.5	004	00	2.88	0.0067	21.4	6.77	19.8
Sed-325-C120-0-0.5	005	00	4.6	0.0040	21.3	6.35	20.3
Sed-331-C120-0-0.5	006	00	6.04	0.0041	21.1	6.24	15.4
Sed-333-C120-0-0.5	007	00	0.58	0.0038	21.4	7.22	20.1
Sed-335-C120-0-0.5	008	00	0.63	0.0035	22.2	7.12	20.1
Sed-337-C120-0-0.5	009	00	5.73	0.0175	22.1	6.87	20.5
Sed-339-C120-0-0.5	010	00	0.3	0.0019	21.8	7.19	20.3
Laboratory Control	000	07	0.54	0.0033	20.4	7.22	19.5
Sed-321-C120-0-0.5	001	07	1.53	0.0024	20.3	6.63	19.6
Sed-322-C120-0-0.5	002	07	2.32	0.0027	20.3	6.50	19.8
Sed-323-C120-0-0.5	003	07	0.61	0.0017	20.1	6.89	19.5
Sed-324-C120-0-0.5	004	07	0.95	0.0029	19.9	6.94	19.6
Sed-325-C120-0-0.5	005	07	0.49	0.0038	19.6	7.35	19.5
Sed-331-C120-0-0.5	006	07	6.51	0.0046	20.3	6.28	17.8
Sed-333-C120-0-0.5	007	07	0.42	0.0032	20.2	7.33	19.7
Sed-335-C120-0-0.5	008	07	0.21	0.0010	20.3	7.13	19.5
Sed-337-C120-0-0.5	009	07	2.53	0.0051	19.7	6.76	19.6
Sed-339-C120-0-0.5	010	07	0.13	0.0010	19.9	7.33	19.4
Laboratory Control	000	14	0.52	0.0049	20.5	7.41	19.4
Sed-321-C120-0-0.5	001	14	1.13	0.0012	20.6	6.46	19.4

Field ID	Sample Number	Day	Total Ammonia (mg/L)	Unionized Ammonia (mg/L)	Temp (°C)	pH (SU)	Salinity (‰)
Sed-322-C120-0-0.5	002	14	1.65	0.0026	20.2	6.64	19.6
Sed-323-C120-0-0.5	003	14	0.58	0.0013	19.3	6.84	20.7
Sed-324-C120-0-0.5	004	14	0.49	0.0015	20.4	6.93	19.5
Sed-325-C120-0-0.5	005	14	0.31	0.0042	20.4	7.57	19.0
Sed-331-C120-0-0.5	006	14	10.3	0.0082	20.6	6.33	18.8
Sed-333-C120-0-0.5	007	14	0.2	0.0016	20.7	7.34	19.5
Sed-335-C120-0-0.5	008	14	0.24	0.0018	20.9	7.30	19.1
Sed-337-C120-0-0.5	009	14	1.55	0.0078	20.4	7.14	19.3
Sed-339-C120-0-0.5	010	14	0.15	0.0016	20.6	7.47	18.4
Laboratory Control	000	21	1.48	0.0194	21.9	7.51	19.8
Sed-321-C120-0-0.5	001	21	2.24	0.0026	21.6	6.46	19.5
Sed-322-C120-0-0.5	002	21	0.86	0.0020	21.9	6.75	19.8
Sed-323-C120-0-0.5	003	21	0.62	0.0019	21.5	6.89	19.8
Sed-324-C120-0-0.5	004	21	0.32	0.0019	21.8	7.16	19.9
Sed-325-C120-0-0.5	005	21	0.2	0.0022	21.7	7.44	19.8
Sed-331-C120-0-0.5	006	21	7.62	0.0083	21.7	6.43	19.1
Sed-333-C120-0-0.5	007	21	0.23	0.0017	22.2	7.26	19.8
Sed-335-C120-0-0.5	008	21	0.38	0.0024	22.1	7.18	19.7
Sed-337-C120-0-0.5	009	21	1.18	0.0081	22.1	7.22	19.8
Sed-339-C120-0-0.5	010	21	<0.1	<0.0017	22.0	7.63	18.7
Laboratory Control	000	28	1.9	0.0370	22.4	7.67	20.1
Sed-321-C120-0-0.5	001	28	4.02	0.0089	22.6	6.71	19.8
Sed-322-C120-0-0.5	002	28	5.1	0.0139	22.6	6.80	19.7
Sed-323-C120-0-0.5	003	28	1.18	0.0033	22.7	6.81	20.3
Sed-324-C120-0-0.5	004	28	0.28	0.0023	22.4	7.29	20.2
Sed-325-C120-0-0.5	005	28	0.26	0.0025	22.3	7.36	20.1
Sed-331-C120-0-0.5	006	28	5.26	0.0118	22.5	6.72	19.4
Sed-333-C120-0-0.5	007	28	0.25	0.0023	22.9	7.32	20.0
Sed-335-C120-0-0.5	008	28	0.48	0.0029	22.9	7.14	20.0
Sed-337-C120-0-0.5	009	28	1.58	0.0143	22.8	7.32	20.1
Sed-339-C120-0-0.5	010	28	<0.1	<0.0014	22.3	7.52	20.1

Note: Additional water quality and analytical support data provided in Appendix A.
The published threshold for *Leptocheirus* in waters with a pH of 7.7 is <60mg/L measured as total ammonia and <0.8mg/L measured as unionized ammonia.

APPENDIX A: RAW DATA AND STATISTICAL SUPPORT

Contents	Number of Pages
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Sample Key	1
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Organism History Record	1
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28 day *Leptocheirus plumulosus* Survival, Growth and Reproduction Sediment Evaluation

Sample Collection and Receipt Information

<<< Select a Laboratory >>>

#N/A
#N/A
info@enthalpy.com

ENTHALPY ANALYTICAL

34122

Chain of Custody

Date 5/28/20 Page 1 of 1

Sample Collection By: JNH

Report to:

Company	Mabbett & Associates
Address	105 Central Street Suite 4100
City/State/Zip	Stoneham MA 02180
Contact	Steve Vetere
Phone	617-285-0640
Email	vetere@mabbett.com

Invoice To: Same as Report to ☒

Company	
Address	
City/State/Zip	
Contact	
Phone	
Email	

ANALYSES REQUIRED

Enthalpy Matrix Codes:
G = Grab
C = Composite
FW = Freshwater
SW = Seawater
Sed = Sediment
STRM = Stormwater
GW = Groundwater
WW = Wastewater
O = Other (specify)

	SAMPLE ID	SAMPLE Date	Time	Type (G or C)	MATRIX CODE (FW, SW, Sed, STRM, GW, WW, O)	Container Type	Qty	COMMENTS	Toxicity (see invoice)	Receipt Temperature (°C)
1	Sed-321-C120-0-0.5	5/28/20	1155	G	Sed	2 gal plastic	1		X	
2	Sed-322-C120-0-0.5	5/28/20	1205	G	Sed	2 gal plastic	1		X	
3	Sed-323-C120-0-0.5	5/28/20	1215	G	Sed	2 gal plastic	1		X	
4	Sed-324-C120-0-0.5	5/28/20	1225	G	Sed	2 gal plastic	1		X	
5	Sed-325-C120-0-0.5	5/28/20	1235	G	Sed	2 gal plastic	1		X	
6	Sed-331-C120-0-0.5	5/28/20	1100	G	Sed	2 gal plastic	1		X	
7	Sed-333-C120-0-0.5	5/28/20	1025	G	Sed	2 gal plastic	1		X	
8	Sed-335-C120-0-0.5	5/28/20	1010	G	Sed	2 gal plastic	1		X	
9	Sed-337-C120-0-0.5	5/28/20	0955	G	Sed	2 gal plastic	1		X	
10	Sed-339-C120-0-0.5	5/28/20	0940	G	Sed	2 gal plastic	1		X	

PROJECT INFORMATION		SAMPLE RECEIPT	
Project Name:	Blue Beach FUDS	Total No. of Containers	
PO No.:	R7063002.000.007	Received Good Condition?	
Shipped Via:	Delivered	Matches Test Schedule?	

SPECIAL INSTRUCTIONS/COMMENTS:

5.7°C upon receipt (T-302) - JTP

1) RELINQUISHED BY (CLIENT)	2) RECEIVED BY (COURIER)
(Signature) (Time) 10:50	(Signature) (Time)
(Printed Name) Jordan Herbert (Date) 5/29/20	(Printed Name) (Date)
(Company) Mabbett + Associates	(Company)
3) RELINQUISHED BY (COURIER)	**4) RECEIVED BY (LABORATORY)**
(Signature) (Time)	(Signature) T. Pw (Time) 1050
(Printed Name) (Date)	(Printed Name) James T. Provencher (Date) 05/29/20
(Company)	(Company) Enthalpy Analytical (Log-in #s)

Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted.
Shaded areas are for lab use only
Report turn-around-time varies depending on length of test; please inquire with your project manager.

http://enthalpy.com/environmental-toxicology-2/

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	34122		
SDG No:			
Project:	Blue Beach FUDS Site, Quonset, RI		
Delivered via:	Client		
Date and Time Received:	05/29/20 1050	Date and Time Logged into Lab:	05/29/20 1330
Received By:	JTP	Logged into Lab by:	RAM
Air bill / Way bill:	NA	Cooler on ice/packs:	Yes
Custody Seals present/intact	NA	Cooler blank temp (C) at arrival:	5.7C
		Thermometer ID:	T-302
Number of COC Pages:	1		
		Were VOC vials free of headspace?	NA
COC Complete:	Yes	pH Test strip lot ID:	NA

Were samples received within holding time? Yes
Does the info on the COC match the samples? Yes

Client notification/authorization: NA

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Sed-321-C120-0-0.5	34122-001	S	Lp28Day	2 gallon HDF	4C	Yes
Sed-322-C120-0-0.5	34122-002	S	Lp28Day	2 gallon HDF	4C	Yes
Sed-323-C120-0-0.5	34122-003	S	Lp28Day	2 gallon HDF	4C	Yes
Sed-324-C120-0-0.5	34122-004	S	Lp28Day	2 gallon HDF	4C	Yes
Sed-325-C120-0-0.5	34122-005	S	Lp28Day	2 gallon HDF	4C	Yes
Sed-331-C120-0-0.5	34122-006	S	Lp28Day	2 gallon HDF	4C	Yes
Sed-333-C120-0-0.5	34122-007	S	Lp28Day	2 gallon HDF	4C	Yes
Sed-335-C120-0-0.5	34122-008	S	Lp28Day	2 gallon HDF	4C	Yes
Sed-337-C120-0-0.5	34122-009	S	Lp28Day	2 gallon HDF	4C	Yes
Sed-339-C120-0-0.5	34122-010	S	Lp28Day	2 gallon HDF	4C	Yes

Notes and qualifications:

28 day *Leptocheirus plumulosus* Survival, Growth and Reproduction Sediment Evaluation

Client Communications

MONTROSE ENVIRONMENTAL

Renee McIsaac <renee.mcisaac@enthalpy.com>

RE: Blue Beach FUDS Toxicity Testing (R7063002.000.007)

1 message

Stephen A. Vetere <vetere@mabbett.com> Fri, May 29, 2020 at 2:02 PM
To: Renee McIsaac <renee.mcisaac@enthalpy.com>
Cc: James Provencher <james.provencher@enthalpy.com>, Kirk Cram <kirk.cram@enthalpy.com>, "Martin W, David" <martin@mabbett.com>, Herbert Jordan <Herbert@mabbett.com>, "Archer, Christine" <Christine.Archer@aecom.com>

Thank you Renee.

For our purposes, the reference samples will be SED-321, SED-322, SED-323, SED-324, and SED-325.

Thanks,

Steve

_____

Stephen A. Vetere, PE, LSP, LEP

Vice President, Environment, Engineering, and Infrastructure

Mabbett & Associates, Inc.

Scientists | Engineers | Program Managers

1500 District Avenue, Burlington, MA 01803

Office: 781-275-6050 Ext. 312

Mobile: 617-285-0640

From: Renee McIsaac <renee.mcisaac@enthalpy.com>
Sent: Friday, May 29, 2020 1:54 PM
To: Stephen A. Vetere <vetere@mabbett.com>
Cc: James Provencher <james.provencher@enthalpy.com>; Kirk Cram <kirk.cram@enthalpy.com>
Subject: Re: Blue Beach FUDS Toxicity Testing

Greetings,

We received 10 sediment samples for the Blue Beach study today, and all samples were received in good condition.

I have attached a copy of the sample receipt documents for your reference.

Could you let me know if any of these samples should be treated as reference samples?

Please let me know if you have any questions.

Regards,

Renée Ashley McIsaac

Project Manager

EA Logo_Horizontal

L. plumulosus 28 Day Sediment Evaluation.
Blue Beach FUDS Site. Study 34122. June 2020.

Test Sediment Preparation Notes

Study: 34122

Client: Mabbett & Associates

Project: Blue Beach FUDS Site, Quonset, RI

Lab Code	Field ID	Sample Number	Initials & Date	Notes
34122-001	Sed-321-C120-0-0.5	001	PBS 06/02	2 gal bucket sieved. About 750 mL of roots detritus & earthworms removed. moist dark sediment throughout sample
34122-002	Sed-322-C120-0-0.5	002	BG 06/02/20	~2 gal sieved. ≈1.5L excluded of rocks, roots, and a couple of earthworms. Sediment was very soil-like in that it was trapped in roots and fairly well moistened.
34122-003	Sed-323-C120-0-0.5	003	PBS 06/04/20	2 gal bucket sieved. 600 mL of rock + roots removed moist dark sediment.
34122-004	Sed-324-C120-0-0.5	004	JTP 06/02/20	2 gallons sieved. ≈ 1/2 gallon excluded. Small rocks, sticks. Granular, high moisture.
34122-005	Sed-325-C120-0-0.5	005	BG 06/02/20	2 gallons sieved. ≈ 1/2 gallon excluded of pebbles and roots. Sandy, high moisture.
34122-006	Sed-331-C120-0-0.5	006	JTP 06/03/20	2 gallons sieved, ≈ 1/2 gallon excluded. Sticks & reeds. Very high moisture, "jet" black color
34122-007	Sed-333-C120-0-0.5	007	BG 06/03/20	2 gallons sieved @ 4hm. ≈ 1/2 gallon excluded of roots and debris. Entire sample was a root ball with very fine sediment.
34122-008	Sed-335-C120-0-0.5	008	JTP 06/03/20	2 gallons sieved, ≈ 1/2 gallon excluded. Roots, Sticks, leaves. High moisture, black.
34122-009	Sed-337-C120-0-0.5	009	BG 06/03/20	2 gallons sieved. ≈ 100mL excluded of roots and debris. Black fine sediment, high moisture.
34122-010	Sed-339-C120-0-0.5	010	JTP 06/03/20	2 gallons sieved. ≈ 3/4 gallon excluded. All large rocks, Sandy / granular.

Note: Samples are to be sieved using a 2mm screen.

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DN: cn=Renee McIsaac, o=Enthalpy Analytical, ou=Project Manager / QAU Member, email=renee.mcisaac@enthalpy.com, c=US
Date: 2020.05.29 15:11:18 -04'00'

Reviewed by: James Provencher

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DN: cn=James Provencher, o=Enthalpy Analytical LLC, ou=Technical Manager, email=james.provencher@enthalpy.com, c=US
Date: 2020.06.01 08:28:34 -04'00'

Sample Key

Study: 34122
Client: Mabbett & Associates
Project: Blue Beach FUDS Site, Quonset, RI

Lab Code	Sample ID	Sample Number	Designation	Sampled		Received	
34122-000	Laboratory Control	000	Lab Control				
34122-001	Sed-321-C120-0-0.5	001	Reference	5/28/2020	1155	5/29/2020	1050
34122-002	Sed-322-C120-0-0.5	002	Reference	5/28/2020	1205	5/29/2020	1050
34122-003	Sed-323-C120-0-0.5	003	Reference	5/28/2020	1215	5/29/2020	1050
34122-004	Sed-324-C120-0-0.5	004	Reference	5/28/2020	1225	5/29/2020	1050
34122-005	Sed-325-C120-0-0.5	005	Reference	5/28/2020	1235	5/29/2020	1050
34122-006	Sed-331-C120-0-0.5	006	Project	5/28/2020	1100	5/29/2020	1050
34122-007	Sed-333-C120-0-0.5	007	Project	5/28/2020	1025	5/29/2020	1050
34122-008	Sed-335-C120-0-0.5	008	Project	5/28/2020	1010	5/29/2020	1050
34122-009	Sed-337-C120-0-0.5	009	Project	5/28/2020	955	5/29/2020	1050
34122-010	Sed-339-C120-0-0.5	010	Project	5/28/2020	940	5/29/2020	1050

28 day *Leptocheirus plumulosus* Survival, Growth and Reproduction Sediment Evaluation

Bench Data

Pre-Assay Monitoring
Leptocheirus plumulosus 28 Day Sediment Evaluation

Study: 34122 **Client: Mabbett & Associates** **Project: Blue Beach FUDS Site**

Day	Date	Overlying Water Renewed	Pore Water Ammonia Check	Initial	Notes
0	06/04/20	-	-	BG	Sediment loaded into test chambers
1	06/05/20	✓	–	BG	
2	06/06/20	✓	–	PES	
3	06/07/20	✓	–	PES	
4	06/08/20	✓	–	JTP	
5	06/09/20	✓	JTP ✓	JTP	
6	06/10/20	✓	–	PES	
7	06/11/20	✓	–	JTP	
8	06/12/20	✓	–	BG	
9	06/13/20	✓	–	BG	
10	06/14/20	✓	–	PES	
11	06/15/20	✓	–	PES	
12	06/16/20	✓	–	PES	
13					
14					

Daily Renewal:	Overlying Water Salinity:	Temperature:
One Volume Addition	20ppt	25°C

Notes

28 Day L. plumulosus Pre Assay Record – Mabbett & Associates – Blue Beach

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Date: 2020.05.29 15:16:36 -04'00'

Reviewed by: James Provencher

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Date: 2020.06.01 08:29:27 -04'00'

1300 Blue Spruce Drive, Suite C
Fort Collins, Colorado 80524

99LpABS061620

Toll Free: 800/331-5916
Tel: 970/484-5091 Fax:970/484-2514

ORGANISM HISTORY

DATE: 6/15/2020

SPECIES: *Leptocheirus plumulosus*

AGE: 3-4 week

LIFE STAGE: Juvenile

HATCH DATE: Variable

BEGAN FEEDING: Immediately

FOOD: Flake Slurry

Water Chemistry Record:	Current	Range
TEMPERATURE:	25°C	23-26°C
SALINITY/CONDUCTIVITY:	15 ppt	15-21 ppt
TOTAL HARDNESS (as $CaCO_3$):	--	--
TOTAL ALKALINITY (as $CaCO_3$):	120 mg/l	120-175 mg/l
pH:	7.72	7.70-8.20

Comments:

Facility Supervisor

Leptocheirus plumulosus
Initial Weight

Study: 34122

Client: Mabbett & Associates

Project: Blue Beach FUDS Site, Quonset, RI

	REP	TARE WEIGHT (mg)	TOTAL WEIGHT (mg)	NET WEIGHT (mg)	NUMBER of ORGANISMS	MEAN DRY WEIGHT per INDIVIDUAL (mg)
START ORGANISMS	A	209.25	209.91 (E38 04/24)	0.666	10	0.0666
	B	207.48	208.00	0.52	10	0.052
	C	207.57	208.17	1.02	10	0.102
	D	208.97	(E38 04/24) 209.76	0.79	10	0.079
RECORDED BY:		PES	PES	Overall Mean Dry Weight Per Individual:		
DATE:		06/23/20	06/24/20	0.2525		

Balance ID: Ohaus Discovery Balance, Model DV215CD
Serial Number: 1124024313

NOTES:

Lepto Start Dry Weight Record 2019 – Mabbett & Associates – Blue Beach

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Date: 2020.05.29 15:12:58 -04'00'

Reviewed by: James Provencher

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Date: 2020.06.01 08:28:59 -04'00'

Leptocheirus plumulosus 28 Day Sediment Evaluation

Study: 34122 **Client: Mabbett & Associates** **Project: Blue Beach FUDS Site**

Day	Date	Renew	Fed			Initial	Notes
0	06/17/20	✓	1mL	Wednesday	✓	PES	
1	06/18/20	✓		Thursday		PES	
2	06/19/20	✓	1mL	Friday	✓	BG	
3	06/20/20	✓		Saturday		BG	
4	06/21/20	✓		Sunday		PES	
5	06/22/20	✓	1mL	Monday	✓	PES	
6	06/23/20	✓		Tuesday		PES	
7	06/24/20	✓	1mL	Wednesday	✓	PES	
8	06/25/20	✓		Thursday		DES	Low DO SWI 006 airline pulled back in water
9	06/26/20	✓	1mL	Friday	✓	BG	
10	06/27/20	✓		Saturday		BG	
11	06/28/20	✓		Sunday		PES	
12	06/29/20	✓	1mL	Monday	✓	PES	
13	06/30/20	✓		Tuesday		PES	
14	07/01/20	✓	2mL	Wednesday	✓	PES	Temp low bath was not running corrective action taken. Pump d rec'd
15	07/02/20	✓		Thursday		BG	
16	07/03/20	✓	2mL	Friday	✓	BG	
17	07/04/20	✓		Saturday		BG	
18	07/05/20	✓		Sunday		PES	
19	07/06/20	✓	2mL	Monday	✓	PES	
20	07/07/20	✓		Tuesday		PES	
21	07/08/20	✓	2mL	Wednesday	✓	PES	
22	07/09/20	✓		Thursday		JTP	
23	07/10/20	✓	2mL	Friday	✓	JTP	
24	07/11/20	✓		Saturday		PBS	
25	07/12/20	✓		Sunday		PBS	
26	07/13/20	✓	2mL	Monday	✓	PBS	
27	07/14/20	✓		Tuesday		PBS	
28	07/15/20	—		Wednesday		PES	

+turned back on to maintain pressure in bath

Pore water collected for: pH, Salinity, Temperature and Ammonia

Overlying water collected for: Ammonia

Day 0	Initial:	PES
Day 7	Initial:	PES
Day 14	Initial:	PES
Day 21	Initial:	PBS
Day 28	Initial:	RAM

- **Feed: Monday / Wednesday / Friday**
- **Overlying Salinity: 20ppt**
- **Temperature: 25°C**

28 Day L. plumulosus Daily Record – Mabbett & Associates – Blue Beach

Issued by: Renee McIsaac

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DN: cn=Renee McIsaac, o=Enthalpy Analytical, ou=Project Manager / QAU Member, email=renee.mcisaac@enthalpy.com, c=US
Date: 2020.06.16 12:28:09 -04'00'

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Date: 2020.06.16 16:07:14 -04'00'

Pore Water Quality Record

Study: 34122 **Client: Mabbett & Associates** **Project: Blue Beach FUDS Site**

Sample Number	Temp. (C)	pH (SU)	Salinity (ppt)	Pre-Assay Pore Water Quality
000	~~19.4~~ 19.0	6.72	~~18.7~~ 22.0	
001	19.4	6.49	18.7	
002	19.1	6.62	19.3	Meter IDs
003	19.3	6.45	16.9	
004	19.2	6.28	18.4	Salinity/Temp: 159
005	19.3	6.13	18.5	pH: 168
006	19.4	6.40	5.9	Date: 06/09/20
007	19.4	7.20	18.9	Initial: JTP
008	19.5	7.22	18.1	
009	19.5	7.11	20.2	
010	19.2	7.51	19.6	

Sample Number	Temp. (C)	pH (SU)	Salinity (ppt)	Day 0 Pore Water Quality
000	22.0	6.75	20.9	
001	22.0	6.41	20.0	
002	22.1	6.43	19.6	Meter IDs
003	21.9	6.40	19.8	
004	21.4	6.77	19.8	Salinity/Temp: ML01
005	21.3	6.35	20.3	pH: ML01
006	21.1	6.24	15.4	Date: 06/17/20
007	21.4	7.22	20.1	Initial: PBS
008	~~21~~ 22.2	7.12	20.1	
009	22.1	6.87	20.5	
010	21.8	7.19	20.3	

Sample Number	Temp. (C)	pH (SU)	Salinity (ppt)	Day 7 Pore Water Quality
000	20.4	7.22	19.5	
001	20.3	6.63	19.6	
002	20.3	6.50	19.8	Meter IDs
003	20.1	6.89	19.5	
004	19.9	6.94	19.6	Salinity/Temp: ML01
005	19.6	7.35	19.5	pH: ML01
006	20.3	6.28	17.8	Date: 06/24/20
007	20.2	7.33	19.7	Initial: PBS
008	20.3	7.13	19.5	
009	19.7	6.76	19.6	
010	19.9	7.33	19.4	

Sample Pore Water Quality Record –Mabbett & Associates – Blue Beach

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Date: 2020.06.08 11:51:15 -04'00'

Reviewed by: James Provencher

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Date: 2020.06.09 07:39:15 -04'00'

Pore Water Quality Record

Study: 34122 **Client: Mabbett & Associates** **Project: Blue Beach FUDS Site**

Sample Number	Temp. (C)	pH (SU)	Salinity (ppt)	Day 14 Pore Water Quality
000	20.5	7.41	19.4	
001	20.6	6.46	19.4	
002	20.2	6.64	19.6	Meter IDs
003	19.3	6.84	20.7	
004	20.4	6.93	19.5	Salinity/Temp: MLOI
005	20.4	7.57	19.0	pH: MLOI
006	20.6	6.33	18.8	Date: ~~06/09~~ 07/01/20
007	20.7	7.34	19.5	Initial: PBS
008	20.9	7.30	19.1	
009	20.4	7.14	19.3	
010	20.6	7.47	18.4	

Sample Number	Temp. (C)	pH (SU)	Salinity (ppt)	Day 21 Pore Water Quality
000	21.9	7.51	19.8	
001	21.6	6.46	19.5	
002	21.9	6.75	19.8	Meter IDs
003	21.5	6.89	19.8	
004	21.8	7.16	19.9	Salinity/Temp: MLOI
005	21.7	7.44	19.8	pH: MLOI
006	21.7	6.43	19.1	Date: 07/08/20
007	22.2	7.26	19.8	Initial: PBS
008	22.1	7.18	19.7	
009	22.1	7.22	19.8	
010	22.0	7.63	18.7	

Sample Number	Temp. (C)	pH (SU)	Salinity (ppt)	Day 28 Pore Water Quality
000	22.4	7.67	20.1	
001	22.6	6.71	19.8	
002	22.6	6.80	19.7	Meter IDs
003	22.7	6.81	20.3	
004	22.4	7.29	20.2	Salinity/Temp: MLOI
005	22.3	7.36	20.1	pH: MLOI
006	22.5	6.72	19.4	Date: 07/15/20
007	22.9	7.32	20.0	Initial: RAM
008	22.9	7.14	20.0	
009	22.8	7.32	20.1	
010	22.3	7.52	20.1	

Sample Pore Water Quality Record –Mabbett & Associates – Blue Beach

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DN: cn=Renee McIsaac, o=Enthalpy Analytical, ou=Project Manager / QAU Member, email=renee.mcisaac@enthalpy.com, c=US
Date: 2020.06.08 11:51:43 -04'00'

Reviewed by: James Provencher

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Date: 2020.06.09 07:39:32 -04'00'

Leptocheirus plumulosus
Day 28 Recovery Record

Study: 34122 **Client: Mabbett & Associates** **Project: Blue Beach FUDS Site**

Field ID	Sample Number	Rep	Pos	# Alive			(survival counts)	(sex determination, check counts)
				Adults	Juveniles	Females	Initials	Initials
Sed-325-C120-0-0.5	005	1	1	18	24	12	PES	BG
Sed-321-C120-0-0.5	001	1	2	0	3	0	PES	
Sed-324-C120-0-0.5	004	1	3	18	15	10	PES	
Sed-339-C120-0-0.5	010	1	4	20	7	17	PES	
Sed-323-C120-0-0.5	003	1	5	19	36	12	PES	
Laboratory Control	000	1	6	13	6	7	PES	
Sed-331-C120-0-0.5	006	1	7	20	4	14	PES	
Sed-322-C120-0-0.5	002	1	8	0	0	0	PES	
Sed-335-C120-0-0.5	008	1	9	17	3	11	PES	
Sed-333-C120-0-0.5	007	1	10	20	28	11	PES	
Sed-337-C120-0-0.5	009	1	11	20	58	7	PES	
Sed-337-C120-0-0.5	009	2	12	20	68	8	PES	
Sed-325-C120-0-0.5	005	2	13	0	4	0	PES	
Sed-323-C120-0-0.5	003	2	14	0	0	0	PES	
Sed-331-C120-0-0.5	006	2	15	19	10	12	PES	
Sed-333-C120-0-0.5	007	2	16	19	47	13	PES	
Laboratory Control	000	2	17	19	45	9	RAM	
Sed-335-C120-0-0.5	008	2	18	14	22	8	RAM	
Sed-322-C120-0-0.5	002	2	19	16	36	11	RAM	
Sed-339-C120-0-0.5	010	2	20	21	3	17	RAM	

(EW) BG 7/16 only 12 adults found in rep 6.

NR 7/21/20 12 adults used for # survived and pan count in stats

(EW) PBS 7/16 20 organisms found in rep 16

NR 7/21/20 20 adults used for # survive and pan count in stat

(EW) PBS 0 alive 2 dead body found 7/15

Leptocheirus plumulosus Recovery Record – Mabbett & Associates – Blue Beach [Page 1 of 5]

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DN: cn=Renee McIsaac, o=Enthalpy Analytical, ou=Project Manager / QAU Member, email=renee.mcisaac@enthalpy.com, c=US
Date: 2020.07.07 12:52:07 -04'00'

Reviewed by: James Provencher

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DN: cn=James Provencher, o=Enthalpy Analytical LLC, ou=Technical Manager, email=james.provencher@enthalpy.com, c=US
Date: 2020.07.13 08:01:08 -04'00'

Leptocheirus plumulosus
Day 28 Recovery Record

Study: 34122 **Client: Mabbett & Associates** **Project: Blue Beach FUDS Site**

Field ID	Sample Number	Rep	Pos	# Alive			(survival counts)	(sex determination, check counts)
				Adults	Juveniles	Females	Initials	Initials
Sed-324-C120-0-0.5	004	2	21	19	54	12	RAM	BG
Sed-321-C120-0-0.5	001	2	22	1	2	1	↓	↓
Sed-339-C120-0-0.5	010	3	23	17	6	12	↓	↓
Sed-337-C120-0-0.5	009	3	24	20	36	15	↓	↓
Sed-325-C120-0-0.5	005	3	25	20	30	13	↓	↓
Sed-321-C120-0-0.5	001	3	26	20	10	15	↓	↓
Laboratory Control	000	3	27	19	81	11	↓	↓
Sed-331-C120-0-0.5	006	3	28	18	12	12	MW	↓
Sed-323-C120-0-0.5	003	3	29	20	41	13	RAM	↓
Sed-335-C120-0-0.5	008	3	30	8	4	6	RAM	↓
Sed-322-C120-0-0.5	002	3	31	20	47	7	RAM	JTP
Sed-333-C120-0-0.5	007	3	32	JTP 07/16 ~~2~~ 20	JTP 07/16 ~~5~~ 58	10	RAM	↓
Sed-324-C120-0-0.5	004	3	33	18	32	8	MW	↓
Sed-337-C120-0-0.5	009	4	34	JTP 07/16 ~~19~~ 20	~~3~~ 156 (ES82501)	11	PES	↓
Sed-325-C120-0-0.5	005	4	35	19	34	6	PES	↓
Sed-333-C120-0-0.5	007	4	36	20	83	9	RAM	↓
Sed-323-C120-0-0.5	003	4	37	20	26	9	PES	↓
Laboratory Control	000	4	38	JTP 07/16 ~~20~~ 19	JTP 07/16 ~~26~~ 29	10	PES	↓
Sed-321-C120-0-0.5	001	4	39	20	4	7	PES	↓
Sed-331-C120-0-0.5	006	4	40	20	5	12	PES	↓

Leptocheirus plumulosus Recovery Record – Mabbett & Associates – Blue Beach [Page 2 of 5]

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Digitally signed by Renee McIsaac
DN: cn=Renee McIsaac, o=Enthalpy Analytical, ou=Project Manager / QAU Member, email=renee.mcisaac@enthalpy.com, c=US
Date: 2020.07.07 12:52:16 -04'00'

Reviewed by: James Provencher
Digitally signed by James Provencher
DN: cn=James Provencher, o=Enthalpy Analytical LLC, ou=Technical Manager, email=james.provencher@enthalpy.com, c=US
Date: 2020.07.13 08:02:09 -04'00'

Leptocheirus plumulosus
Day 28 Recovery Record

Study: 34122 **Client: Mabbett & Associates** **Project: Blue Beach FUDS Site**

Field ID	Sample Number	Rep	Pos	# Alive			(survival counts)	(sex determination, check counts)
				Adults	Juveniles	Females	Initials	Initials
Sed-339-C120-0-0.5	010	4	41	18	2	5	[illegible]	JTP
Sed-324-C120-0-0.5	004	4	42	20	16	4		
Sed-322-C120-0-0.5	002	4	43	19	10	6		
Sed-335-C120-0-0.5	008	4	44	JTP E3 07/11/20 ~~11~~ 12	0	7		
Sed-331-C120-0-0.5	006	5	45	18	14	8		
Sed-333-C120-0-0.5	007	5	46	JTP E3 07/11/20 ~~19~~ 20	47	10		
Sed-324-C120-0-0.5	004	5	47	19	54	7		
Laboratory Control	000	5	48	19	50	8		
Sed-325-C120-0-0.5	005	5	49	16	34	4		
Sed-321-C120-0-0.5	001	5	50	20	33	7		
Sed-339-C120-0-0.5	010	5	51	16 ~~7~~ E3 TW 7/15	12	7		
Sed-335-C120-0-0.5	008	5	52	17	11	10		
Sed-323-C120-0-0.5	003	5	53	18 ~~9~~ E3 TW 7/15	4	13		
Sed-322-C120-0-0.5	002	5	54	9	0	6		↓
Sed-337-C120-0-0.5	009	5	55	20	103	10		BG
Sed-324-C120-0-0.5	004	6	56	JTP E3 07/11/20 ~~19~~ 20	7	14		
Sed-331-C120-0-0.5	006	6	57	17	3	11	↓	
Sed-335-C120-0-0.5	008	6	58	11	0	6	MW	
Sed-333-C120-0-0.5	007	6	59	21	26	14	MW	
Laboratory Control	000	6	60	20	45	13	MW	↓

Leptocheirus plumulosus Recovery Record – Mabbett & Associates – Blue Beach [Page 3 of 5]

Issued by: Renee McIsaac
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Date: 2020.07.07 12:52:24 -04'00'

Reviewed by: James Provencher
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Date: 2020.07.13 08:02:21 -04'00'

Leptocheirus plumulosus
Day 28 Recovery Record

Study: 34122 **Client: Mabbett & Associates** **Project: Blue Beach FUDS Site**

Field ID	Sample Number	Rep	Pos	# Alive			(survival counts)	(sex determination, check counts)
				Adults	Juveniles	Females	Initials	Initials
Sed-337-C120-0-0.5	009	6	61	18	47	12	MW	BG
Sed-321-C120-0-0.5	001	6	62	18	21	13	MW	BG
Sed-323-C120-0-0.5	003	6	63	20	22	15	MW	BG
Sed-322-C120-0-0.5	002	6	64	18	29	10	MW	JTP
Sed-339-C120-0-0.5	010	6	65	18	19	7	MW	↓
Sed-325-C120-0-0.5	005	6	66	0	0	0	MW	↓
Sed-335-C120-0-0.5	008	7	67	8	3	5	PES	↓
Sed-325-C120-0-0.5	005	7	68	0	0	0	MW	↓
Sed-322-C120-0-0.5	002	7	69	16	11	10	MW	↓
Sed-337-C120-0-0.5	009	7	70	16	24	7	PES	↓
Laboratory Control	000	7	71	07/16 E3 JTP 17/18	45	7	PES	↓
Sed-323-C120-0-0.5	003	7	72	2	0	1	PES	↓
Sed-324-C120-0-0.5	004	7	73	07/16 E3 JTP 17/18	35	9	PES	↓
Sed-333-C120-0-0.5	007	7	74	13	0	7	PES	↓
Sed-321-C120-0-0.5	001	7	75	20	10	6	PES	↓
Sed-331-C120-0-0.5	006	7	76	15	13	7	PES	↓
Sed-339-C120-0-0.5	010	7	77	20	6	8	PES	✓
Sed-333-C120-0-0.5	007	8	78	19	16	12	PES	
Sed-331-C120-0-0.5	006	8	79	18	0	16	BG	BG
Laboratory Control	000	8	80	19	81	11	BG	BG

E3 BG 07/15
rep 80 had label that was mangled during sieving. It was included in the Surv count.
NR 7/21/20 19 used for # survived and 18 used for pan count in stats

Issued by: Renee McIsaac
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Date: 2020.07.07 12:52:32 -04'00'

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Date: 2020.07.13 08:02:36 -04'00'

Leptocheirus plumulosus
Day 28 Recovery Record

Study: 34122 **Client: Mabbett & Associates** **Project: Blue Beach FUDS Site**

Field ID	Sample Number	Rep	Pos	# Alive			(survival counts)	(sex determination, check counts)
				Adults	Juveniles	Females	Initials	Initials
Sed-339-C120-0-0.5	010	8	81	(E3) JTP 07/15 ~~19~~ 20	0	14	JTP	BG
Sed-324-C120-0-0.5	004	8	82	5	0	4	MW	BG
Sed-325-C120-0-0.5	005	8	83	17	15	14	JTP	BG
Sed-337-C120-0-0.5	009	8	84	19	113	~~14~~ (E2) MW 07/14 11	MW	BG
Sed-323-C120-0-0.5	003	8	85	18	1	15	JTP	BG
Sed-322-C120-0-0.5	002	8	86	19	20	11	BG	BG
Sed-335-C120-0-0.5	008	8	87	10	0	7	JTP	BG
Sed-321-C120-0-0.5	001	8	88	17	5	13	RAM	BG

(E12) BG 07/16 19 organisms pulled for rep 81. NR 7/21/20 19 used for #survived and pan count in stat

Leptocheirus plumulosus Recovery Record – Mabbett & Associates – Blue Beach [Page 5 of 5]

Issued by: Renee McIsaac
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Date: 2020.07.07 12:52:40 -04'00'

Reviewed by: James Provencher
Digitally signed by James Provencher
DN: cn=James Provencher, o=Enthalpy Analytical LLC, ou=Technical Manager, email=james.provencher@enthalpy.com, c=US
Date: 2020.07.13 08:02:54 -04'00'

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation
TASK: Dry Weight Data - Balance Output File
BALANCE: Ohaus Discovery Balance Model DV215CD
Serial #: 112402024313

	07/21/20 JTP	07/13/20 JTP		Duplicates	
Rep	Total Wt (mg)	Tare Wt (mg)		Total Wt (mg)	Tare Wt (mg)
1	226.62	209.96			
2		205.91			
3	225.67	207.62			
4	218.81	206.49			
5	222.93	205.68			
6	218.50	208.35			
7	227.48	209.87			
8		205.92			
9	220.05	207.34			
10	230.07	208.88	x	230.07	208.91
11	237.99	207.48			
12	234.96	206.06			
13		206.91			
14		209.77			
15	225.73	209.14			
16	228.00	208.51			
17	227.07	209.53			
18	219.74	205.25			
19	222.88	207.31			
20	220.81	206.67	x	220.81	206.72
21	229.01	208.49			
22	209.57	208.77			
23	221.38	209.20			
24	232.46	209.66			
25	224.30	206.86			
26	215.58	206.46			
27	227.77	206.34			
28	222.51	206.84			
29	225.70	207.56			
30	210.93	205.43	x	210.91	205.45
31	228.58	207.99			
32	231.46	210.04			
33	227.84	205.89			
34	245.73	207.15			
35	230.18	209.81			
36	231.20	207.66			
37	229.10	206.33			
38	228.97	208.05			
39	226.23	209.16			
40	219.87	207.02	x	219.89	207.04
41	219.93	206.85			
42	225.92	206.55			
43	220.61	206.56			
44	214.92	208.31			
45	219.58	206.42			
46	229.19	207.51			
47	228.88	208.83			
48	229.35	206.60			
49	223.77	207.04			
50	222.04	205.30	x	222.06	205.31

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation
TASK: Dry Weight Data - Balance Output File
BALANCE: Ohaus Discovery Balance Model DV215CD
Serial #: 112402024313

	07/21/20 JTP	07/13/20 JTP		Duplicates	
Rep	Total Wt (mg)	Tare Wt (mg)		Total Wt (mg)	Tare Wt (mg)
51	218.05	206.80			
52	216.95	205.95			
53	221.66	209.33			
54	209.21	205.72			
55	230.95	206.61			
56	221.14	209.96			
57	209.55	203.39			
58	213.23	204.11			
59	222.42	204.30			
60	225.92	204.76	x	225.89	204.74
61	221.93	205.05			
62	216.66	202.41			
63	219.81	203.86			
64	219.87	203.77			
65	215.11	204.26			
66		204.36			
67	210.05	204.39			
68		204.27			
69	217.13	205.01			
70	235.99	204.30	x	236.02	204.28
71	228.71	203.88			
72	208.68	204.98			
73	226.09	204.32			
74	212.29	204.14			
75	225.32	204.61			
76	224.27	204.14			
77	218.92	203.62			
78	222.34	204.68			
79	214.29	205.02			
80	220.34	203.65	x	220.38	203.65
81	215.58	203.89			
82	205.52	204.05			
83	216.16	203.53			
84	235.15	203.83			
85	212.81	203.92			
86	220.23	204.83			
87	211.24	204.84			
88	211.61	203.95	x	211.59	203.96

28 day *Leptocheirus plumulosus* Survival, Growth and Reproduction Sediment Evaluation

Randomization Order and CETIS™ Data Worksheets

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Start Date: 17 Jun-20 12:00 **Species:** Leptocheirus plumulosus **Sample Code:** 34122-000; 000
End Date: 15 Jul-20 12:00 **Protocol:** EPA/600/R-01/020 (2001) **Sample Source:** Blue Beach Site, Quonset, RI
Sample Date: 02 Jun-20 10:00 **Material:** Laboratory Control Sediment **Sample Station:** Laboratory Control; 34122-000

Sample	Rep	Pos	# Exposed	# Survived	Total Weight-mg	Tare Weight-mg	Pan Count	Neonate Weight-mg	# Offspring	#Females	Total Weight - Females in mg	Tare Weight - Females in mg	Pan Count - Females
34122-000; 000	1	6	20	12	218.5	208.35	12		6	7			
34122-000; 000	2	17	20	19	227.07	209.53	19		45	9			
34122-000; 000	3	27	20	19	227.77	206.34	19		81	11			
34122-000; 000	4	38	20	19	228.97	208.05	19		29	10			
34122-000; 000	5	48	20	19	229.35	206.6	19		50	8			
34122-000; 000	6	60	20	20	225.92	204.76	20		45	13			
34122-000; 000	7	71	20	18	228.71	203.88	18		45	7			
34122-000; 000	8	80	20	19	220.34	203.65	18		81	11			
34122-001; 001	1	2	20	0			0		3	0			
34122-001; 001	2	22	20	1	209.57	208.77	1		2	1			
34122-001; 001	3	26	20	20	215.58	206.46	20		10	15			
34122-001; 001	4	39	20	20	226.23	209.16	20		4	7			
34122-001; 001	5	50	20	20	222.04	205.3	20		33	7			
34122-001; 001	6	62	20	18	216.66	202.41	18		21	13			
34122-001; 001	7	75	20	20	225.32	204.61	20		10	6			
34122-001; 001	8	88	20	17	211.61	203.95	17		5	13			
34122-002; 002	1	8	20	0			0		0	0			
34122-002; 002	2	19	20	16	222.88	207.31	16		36	11			
34122-002; 002	3	31	20	20	228.58	207.99	20		47	7			
34122-002; 002	4	43	20	19	220.61	206.56	19		10	6			
34122-002; 002	5	54	20	9	209.21	205.72	9		0	6			
34122-002; 002	6	64	20	18	219.87	203.77	18		29	10			
34122-002; 002	7	69	20	16	217.13	205.01	16		11	10			
34122-002; 002	8	86	20	19	220.23	204.83	19		20	11			
34122-003; 003	1	5	20	19	222.93	205.68	19		36	12			
34122-003; 003	2	14	20	0			0		0	0			

Sample	Rep	Pos	# Exposed	# Survived	Total Weight-mg	Tare Weight-mg	Pan Count	Neonate Weight-mg	# Offspring	#Females	Total Weight - Females in mg	Tare Weight - Females in mg	Pan Count - Females
34122-003; 003	3	29	20	20	225.7	207.56	20		41	13			
34122-003; 003	4	37	20	20	229.1	206.33	20		26	9			
34122-003; 003	5	53	20	19	221.66	209.33	19		4	13			
34122-003; 003	6	63	20	20	219.81	203.86	20		22	15			
34122-003; 003	7	72	20	2	208.68	204.98	2		0	1			
34122-003; 003	8	85	20	18	212.81	203.92	18		1	15			
34122-004; 004	1	3	20	18	225.67	207.62	18		15	10			
34122-004; 004	2	21	20	19	229.01	208.49	19		54	12			
34122-004; 004	3	33	20	18	227.84	205.89	18		32	8			
34122-004; 004	4	42	20	20	225.92	206.55	20		16	4			
34122-004; 004	5	47	20	19	228.88	208.83	19		54	7			
34122-004; 004	6	56	20	20	221.14	209.96	20		7	14			
34122-004; 004	7	73	20	18	226.09	204.32	18		35	9			
34122-004; 004	8	82	20	5	205.52	204.05	5		0	4			
34122-005; 005	1	1	20	18	226.62	209.96	18		24	12			
34122-005; 005	2	13	20	0			0		4	0			
34122-005; 005	3	25	20	20	224.3	206.86	20		30	13			
34122-005; 005	4	35	20	19	230.18	209.81	19		34	6			
34122-005; 005	5	49	20	16	223.77	207.04	16		34	4			
34122-005; 005	6	66	20	0			0		0	0			
34122-005; 005	7	68	20	0			0		0	0			
34122-005; 005	8	83	20	17	216.16	203.53	17		15	14			
34122-006; 006	1	7	20	20	227.48	209.87	20		4	14			
34122-006; 006	2	15	20	19	225.73	209.14	19		10	12			
34122-006; 006	3	28	20	18	222.51	206.84	18		12	12			
34122-006; 006	4	40	20	20	219.87	207.02	20		5	12			
34122-006; 006	5	45	20	18	219.58	206.42	18		14	8			
34122-006; 006	6	57	20	17	209.55	203.39	17		3	11			
34122-006; 006	7	76	20	18	224.27	204.14	18		13	7			
34122-006; 006	8	79	20	18	214.29	205.02	18		0	16			
34122-007; 007	1	10	20	20	230.07	208.88	20		28	11			

Sample	Rep	Pos	# Exposed	# Survived	Total Weight-mg	Tare Weight-mg	Pan Count	Neonate Weight-mg	# Offspring	#Females	Total Weight - Females in mg	Tare Weight - Females in mg	Pan Count - Females
34122-007; 007	2	16	20	20	228	208.51	20		47	13			
34122-007; 007	3	32	20	20	231.46	210.04	20		58	10			
34122-007; 007	4	36	20	20	231.2	207.66	20		83	9			
34122-007; 007	5	46	20	20	229.19	207.51	20		47	10			
34122-007; 007	6	59	21	21	222.42	204.3	21		26	14			
34122-007; 007	7	74	20	13	212.29	204.14	13		0	7			
34122-007; 007	8	78	20	19	222.34	204.68	19		16	12			
34122-008; 008	1	9	20	17	220.05	207.34	17		3	11			
34122-008; 008	2	18	20	14	219.74	205.25	14		22	8			
34122-008; 008	3	30	20	8	210.93	205.43	8		4	6			
34122-008; 008	4	44	20	12	214.92	208.31	12		0	7			
34122-008; 008	5	52	20	17	216.95	205.95	17		11	10			
34122-008; 008	6	58	20	11	213.23	204.11	11		0	6			
34122-008; 008	7	67	20	8	210.05	204.39	8		3	5			
34122-008; 008	8	87	20	10	211.24	204.84	10		0	7			
34122-009; 009	1	11	20	20	237.99	207.48	20		58	7			
34122-009; 009	2	12	20	20	234.96	206.06	20		68	8			
34122-009; 009	3	24	20	20	232.46	209.66	20		36	15			
34122-009; 009	4	34	20	20	245.73	207.15	20		156	11			
34122-009; 009	5	55	20	20	230.95	206.61	20		103	10			
34122-009; 009	6	61	20	18	221.93	205.05	18		47	12			
34122-009; 009	7	70	20	16	235.99	204.3	16		24	7			
34122-009; 009	8	84	20	19	235.15	203.83	19		113	11			
34122-010; 010	1	4	20	20	218.81	206.49	20		7	17			
34122-010; 010	2	20	21	21	220.81	206.67	21		3	17			
34122-010; 010	3	23	20	17	221.38	209.2	17		6	12			
34122-010; 010	4	41	20	18	219.93	206.85	18		2	5			
34122-010; 010	5	51	20	17	218.05	206.8	17		12	7			
34122-010; 010	6	65	20	18	215.11	204.26	18		19	7			
34122-010; 010	7	77	20	20	218.92	203.62	20		6	8			
34122-010; 010	8	81	20	19	215.58	203.89	19		0	14			

28 day *Leptocheirus plumulosus* Survival, Growth and Reproduction Sediment Evaluation

CETIS™ Summary, Ad Hoc Query and Analytical Reports

Survival Statistical Analysis

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h		
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d		
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d		
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d		
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h		
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
18-5008-8523	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.5287	34122-001; 001 passed proportion survive	1
15-0734-3760	Proportion Survived	Equal Variance t Two-Sample Test	0.1889	34122-002; 002 passed proportion survive	1
17-2290-5503	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.1028	34122-002; 002 passed proportion survive	1
08-5639-4914	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.5524	34122-003; 003 passed proportion survive	1
09-6630-2478	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.3373	34122-004; 004 passed proportion survive	1
18-6292-3863	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.5246	34122-004; 004 passed proportion survive	1
00-4812-8364	Proportion Survived	Unequal Variance t Two-Sample Test	0.0375	34122-005; 005 failed proportion survived	1
08-8520-9696	Proportion Survived	Equal Variance t Two-Sample Test	0.8730	34122-006; 006 passed proportion survive	1
10-8216-9723	Proportion Survived	Equal Variance t Two-Sample Test	0.1775	34122-006; 006 passed proportion survive	1
13-3322-7132	Proportion Survived	Equal Variance t Two-Sample Test	0.2721	34122-006; 006 passed proportion survive	1
00-0989-2912	Proportion Survived	Unequal Variance t Two-Sample Test	0.9662	34122-006; 006 passed proportion survive	1
00-9952-1467	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.5272	34122-006; 006 passed proportion survive	1
05-3729-9854	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.4141	34122-006; 006 passed proportion survive	1
11-0074-4964	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.8890	34122-006; 006 passed proportion survive	1
12-9767-7345	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.2907	34122-006; 006 passed proportion survive	1
15-4876-2400	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.4587	34122-006; 006 passed proportion survive	1
08-9729-8219	Proportion Survived	Unequal Variance t Two-Sample Test	0.9796	34122-007; 007 passed proportion survive	1
00-8769-3624	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.9422	34122-007; 007 passed proportion survive	1
07-9455-9698	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.9928	34122-007; 007 passed proportion survive	1
09-8587-2399	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.9879	34122-007; 007 passed proportion survive	1
11-6999-5761	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.9406	34122-007; 007 passed proportion survive	1
13-3860-2888	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.9688	34122-007; 007 passed proportion survive	1
15-9429-2198	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.9079	34122-007; 007 passed proportion survive	1
16-9119-2005	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.9824	34122-007; 007 passed proportion survive	1

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test **Enthalpy Analytical, LLC**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-6843-5987	Proportion Survived	Equal Variance t Two-Sample Test	4.4E-04	34122-008; 008 failed proportion survived	1
13-6388-8409	Proportion Survived	Equal Variance t Two-Sample Test	0.0112	34122-008; 008 failed proportion survived	1
15-7942-7153	Proportion Survived	Equal Variance t Two-Sample Test	0.1886	34122-008; 008 passed proportion survive	1
17-4260-9328	Proportion Survived	Equal Variance t Two-Sample Test	6.6E-05	34122-008; 008 failed proportion survived	1
19-5811-1596	Proportion Survived	Equal Variance t Two-Sample Test	0.0099	34122-008; 008 failed proportion survived	1
20-8068-0399	Proportion Survived	Unequal Variance t Two-Sample Test	0.6148	34122-008; 008 passed proportion survive	1
06-7712-3733	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.0486	34122-008; 008 failed proportion survived	1
12-9585-4839	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.0583	34122-008; 008 passed proportion survive	1
02-9265-5529	Proportion Survived	Equal Variance t Two-Sample Test	0.6827	34122-009; 009 passed proportion survive	1
06-4544-9836	Proportion Survived	Equal Variance t Two-Sample Test	0.7299	34122-009; 009 passed proportion survive	1
09-2669-4814	Proportion Survived	Equal Variance t Two-Sample Test	0.9566	34122-009; 009 passed proportion survive	1
04-3500-7719	Proportion Survived	Unequal Variance t Two-Sample Test	0.9783	34122-009; 009 passed proportion survive	1
00-3008-1551	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.9845	34122-009; 009 passed proportion survive	1
05-0818-2674	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.9389	34122-009; 009 passed proportion survive	1
05-6068-9190	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.8198	34122-009; 009 passed proportion survive	1
08-6096-9156	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.9085	34122-009; 009 passed proportion survive	1
09-1225-2040	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.8514	34122-009; 009 passed proportion survive	1
01-8743-7064	Proportion Survived	Equal Variance t Two-Sample Test	0.8959	34122-010; 010 passed proportion survive	1
05-2591-5297	Proportion Survived	Equal Variance t Two-Sample Test	0.3981	34122-010; 010 passed proportion survive	1
12-6414-2147	Proportion Survived	Equal Variance t Two-Sample Test	0.3104	34122-010; 010 passed proportion survive	1
14-7966-9292	Proportion Survived	Equal Variance t Two-Sample Test	0.6560	34122-010; 010 passed proportion survive	1
03-2528-5410	Proportion Survived	Unequal Variance t Two-Sample Test	0.9692	34122-010; 010 passed proportion survive	1
14-3831-3328	Proportion Survived	Unequal Variance t Two-Sample Test	0.9283	34122-010; 010 passed proportion survive	1
05-6223-6292	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.6006	34122-010; 010 passed proportion survive	1
06-1381-4683	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.5221	34122-010; 010 passed proportion survive	1
17-7681-2041	Proportion Survived	Wilcoxon Rank Sum Two-Sample Test	0.5859	34122-010; 010 passed proportion survive	1

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
34122-000; 000	LC	8	0.906	0.800	1.000	0.600	1.000	0.045	0.127	13.97%	0.00%
34122-001; 001	R1	8	0.725	0.361	1.000	0.000	1.000	0.154	0.436	60.12%	20.00%
34122-002; 002	R2	8	0.731	0.445	1.000	0.000	1.000	0.121	0.342	46.80%	19.31%
34122-003; 003	R3	8	0.738	0.381	1.000	0.000	1.000	0.151	0.427	57.84%	18.62%
34122-004; 004	R4	8	0.856	0.649	1.000	0.250	1.000	0.088	0.248	29.02%	5.52%
34122-005; 005	R5	8	0.562	0.170	0.955	0.000	1.000	0.166	0.470	83.49%	37.93%
34122-006; 006		8	0.925	0.880	0.970	0.850	1.000	0.019	0.054	5.78%	-2.07%
34122-007; 007		8	0.950	0.848	1.000	0.650	1.000	0.043	0.122	12.89%	-4.83%
34122-008; 008		8	0.606	0.456	0.757	0.400	0.850	0.064	0.180	29.72%	33.10%
34122-009; 009		8	0.956	0.895	1.000	0.800	1.000	0.026	0.073	7.62%	-5.52%
34122-010; 010		8	0.931	0.877	0.986	0.850	1.000	0.023	0.065	6.99%	-2.76%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.600	0.950	0.950	0.950	0.950	1.000	0.900	0.950
34122-001; 001	R1	0.000	0.050	1.000	1.000	1.000	0.900	1.000	0.850
34122-002; 002	R2	0.000	0.800	1.000	0.950	0.450	0.900	0.800	0.950
34122-003; 003	R3	0.950	0.000	1.000	1.000	0.950	1.000	0.100	0.900
34122-004; 004	R4	0.900	0.950	0.900	1.000	0.950	1.000	0.900	0.250
34122-005; 005	R5	0.900	0.000	1.000	0.950	0.800	0.000	0.000	0.850
34122-006; 006		1.000	0.950	0.900	1.000	0.900	0.850	0.900	0.900
34122-007; 007		1.000	1.000	1.000	1.000	1.000	1.000	0.650	0.950
34122-008; 008		0.850	0.700	0.400	0.600	0.850	0.550	0.400	0.500
34122-009; 009		1.000	1.000	1.000	1.000	1.000	0.900	0.800	0.950
34122-010; 010		1.000	1.000	0.850	0.900	0.850	0.900	1.000	0.950

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28-day Survival, Growth and Reproduction Sediment Evaluation
TASK: Statistical Analysis of Survival

Station	Method	C (H_0)	>	T (H_1)	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Sed-321-C120-0-0.5; 34122-001	Wilcoxon Rank Sum Two-Sample Test	34122-000; 000	>	34122-001; 001	68.5		0.528749	0.05	FALSE		14	2	E
Sed-322-C120-0-0.5; 34122-002	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-002; 002	0.9131401	1.77093	0.1888965	0.05	FALSE	0.1890286	13		C
Sed-322-C120-0-0.5; 34122-002	Wilcoxon Rank Sum Two-Sample Test	34122-000; 000	>	34122-002; 002	56		0.1027972	0.05	FALSE		14	3	E
Sed-323-C120-0-0.5; 34122-003	Wilcoxon Rank Sum Two-Sample Test	34122-000; 000	>	34122-003; 003	69		0.5523698	0.05	FALSE		14	3	E
Sed-324-C120-0-0.5; 34122-004	Wilcoxon Rank Sum Two-Sample Test	34122-000; 000	>	34122-004; 004	56.5		0.5246309	0.05	FALSE		13	3	E
Sed-324-C120-0-0.5; 34122-004	Wilcoxon Rank Sum Two-Sample Test	34122-000; 000	>	34122-004; 004	64.5		0.337296	0.05	FALSE		14	3	E
Sed-325-C120-0-0.5; 34122-005	Unequal Variance t Two-Sample Test	34122-000; 000	>	34122-005; 005	2.046055	1.85955	0.03748294	0.05	TRUE	0.4147573	8		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-006; 006	0.9591229	1.77093	0.1774982	0.05	FALSE	0.0807537	13		C
Sed-331-C120-0-0.5; 34122-006	Wilcoxon Rank Sum Two-Sample Test	34122-000; 000	>	34122-006; 006	62.5		0.290676	0.05	FALSE		14	3	E
Sed-333-C120-0-0.5; 34122-007	Wilcoxon Rank Sum Two-Sample Test	34122-000; 000	>	34122-007; 007	86.5		0.9878788	0.05	FALSE		14	2	E
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-008; 008	4.210923	1.76131	0.00043592	0.05	TRUE	0.1624228	14		C
Sed-337-C120-0-0.5; 34122-009	Wilcoxon Rank Sum Two-Sample Test	34122-000; 000	>	34122-009; 009	80.5		0.9389277	0.05	FALSE		14	3	E
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-009; 009	-0.486698	1.77093	0.6827125	0.05	FALSE	0.0970189	13		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-010; 010	-0.409897	1.76131	0.6559577	0.05	FALSE	0.1333448	14		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-010; 010	0.5067787	1.77093	0.3103982	0.05	FALSE	0.0932196	13		C
Sed-331-C120-0-0.5; 34122-006	Wilcoxon Rank Sum Two-Sample Test	34122-001; 001	>	34122-006; 006	68.5		0.527195	0.05	FALSE		14	3	E
Sed-333-C120-0-0.5; 34122-007	Wilcoxon Rank Sum Two-Sample Test	34122-001; 001	>	34122-007; 007	78		0.9079254	0.05	FALSE		14	1	E
Sed-335-C120-0-0.5; 34122-008	Wilcoxon Rank Sum Two-Sample Test	34122-001; 001	>	34122-008; 008	53		0.05827506	0.05	FALSE		14	1	E
Sed-337-C120-0-0.5; 34122-009	Wilcoxon Rank Sum Two-Sample Test	34122-001; 001	>	34122-009; 009	75.5		0.8198135	0.05	FALSE		14	2	E
Sed-339-C120-0-0.5; 34122-010	Wilcoxon Rank Sum Two-Sample Test	34122-001; 001	>	34122-010; 010	70		0.6006216	0.05	FALSE		14	3	E
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-006; 006	-1.19344	1.77093	0.8729888	0.05	FALSE	0.1653664	13		C
Sed-331-C120-0-0.5; 34122-006	Wilcoxon Rank Sum Two-Sample Test	34122-002; 002	>	34122-006; 006	79		0.8889666	0.05	FALSE		14	3	E
Sed-333-C120-0-0.5; 34122-007	Wilcoxon Rank Sum Two-Sample Test	34122-002; 002	>	34122-007; 007	89		0.9927739	0.05	FALSE		14	2	E
Sed-333-C120-0-0.5; 34122-007	Wilcoxon Rank Sum Two-Sample Test	34122-002; 002	>	34122-007; 007	81		0.9824398	0.05	FALSE		13	2	E
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-008; 008	2.590096	1.77093	0.01121166	0.05	TRUE	0.1988641	13		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-008; 008	0.9121045	1.76131	0.1885763	0.05	FALSE	0.3008256	14		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-009; 009	-1.851904	1.77093	0.9565601	0.05	FALSE	0.1738894	13		C
Sed-337-C120-0-0.5; 34122-009	Wilcoxon Rank Sum Two-Sample Test	34122-002; 002	>	34122-009; 009	87		0.98446	0.05	FALSE		14	4	E
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-010; 010	-1.324608	1.77093	0.8959421	0.05	FALSE	0.1717986	13		C

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28-day Survival, Growth and Reproduction Sediment Evaluation
TASK: Statistical Analysis of Survival

Station	Method	C (H_0)	>	T (H_1)	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-002; 002	>	34122-010; 010	-1.622169	1.85955	0.9282879	0.05	FALSE	0.3021357	8		C
Sed-331-C120-0-0.5; 34122-006	Wilcoxon Rank Sum Two-Sample Test	34122-003; 003	>	34122-006; 006	65		0.4141414	0.05	FALSE		14	3	E
Sed-333-C120-0-0.5; 34122-007	Wilcoxon Rank Sum Two-Sample Test	34122-003; 003	>	34122-007; 007	81		0.9405594	0.05	FALSE		14	2	E
Sed-335-C120-0-0.5; 34122-008	Wilcoxon Rank Sum Two-Sample Test	34122-003; 003	>	34122-008; 008	52		0.04864025	0.05	TRUE		14	0	E
Sed-337-C120-0-0.5; 34122-009	Wilcoxon Rank Sum Two-Sample Test	34122-003; 003	>	34122-009; 009	77		0.8513597	0.05	FALSE		14	3	E
Sed-339-C120-0-0.5; 34122-010	Wilcoxon Rank Sum Two-Sample Test	34122-003; 003	>	34122-010; 010	68.5		0.5221445	0.05	FALSE		14	3	E
Sed-331-C120-0-0.5; 34122-006	Wilcoxon Rank Sum Two-Sample Test	34122-004; 004	>	34122-006; 006	66		0.4586636	0.05	FALSE		14	4	E
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-006; 006	0.6226659	1.77093	0.2721362	0.05	FALSE	0.0922916	13		C
Sed-333-C120-0-0.5; 34122-007	Wilcoxon Rank Sum Two-Sample Test	34122-004; 004	>	34122-007; 007	76		0.9421911	0.05	FALSE		13	3	E
Sed-333-C120-0-0.5; 34122-007	Wilcoxon Rank Sum Two-Sample Test	34122-004; 004	>	34122-007; 007	84		0.9688423	0.05	FALSE		14	3	E
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-008; 008	2.629587	1.76131	0.00990119	0.05	TRUE	0.2231348	14		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-008; 008	5.348758	1.77093	6.614E-05	0.05	TRUE	0.1439397	13		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-009; 009	-0.629175	1.77093	0.7299331	0.05	FALSE	0.106814	13		C
Sed-337-C120-0-0.5; 34122-009	Wilcoxon Rank Sum Two-Sample Test	34122-004; 004	>	34122-009; 009	79.5		0.9084693	0.05	FALSE		14	4	E
Sed-339-C120-0-0.5; 34122-010	Wilcoxon Rank Sum Two-Sample Test	34122-004; 004	>	34122-010; 010	69		0.5858586	0.05	FALSE		14	4	E
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-010; 010	0.2636586	1.77093	0.398088	0.05	FALSE	0.1033754	13		C
Sed-331-C120-0-0.5; 34122-006	Unequal Variance t Two-Sample Test	34122-005; 005	>	34122-006; 006	-2.159602	1.89458	0.9661762	0.05	FALSE	0.4126112	7		C
Sed-333-C120-0-0.5; 34122-007	Unequal Variance t Two-Sample Test	34122-005; 005	>	34122-007; 007	-2.437159	1.85955	0.9796277	0.05	FALSE	0.4166775	8		C
Sed-335-C120-0-0.5; 34122-008	Unequal Variance t Two-Sample Test	34122-005; 005	>	34122-008; 008	-0.301862	1.85955	0.6147721	0.05	FALSE	0.4191292	8		C
Sed-337-C120-0-0.5; 34122-009	Unequal Variance t Two-Sample Test	34122-005; 005	>	34122-009; 009	-2.462197	1.89458	0.9783372	0.05	FALSE	0.4160722	7		C
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-005; 005	>	34122-010; 010	-2.223927	1.89458	0.9692401	0.05	FALSE	0.4152098	7		C

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	18-5008-8523	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:35	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-001; 001 passed proportion survived	30.27%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 1	68.5	n/a	2	14	Exact	0.5287	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.36	2.59	0.1419	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.186099	0.186099	1	1.05	0.3234	Non-Significant Effect
Error	2.48651	0.177608	14			
Total	2.67261		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	10.9	8.89	0.0054	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.787	0.841	0.0019	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.906	0.800	1.000	0.950	0.600	1.000	0.045	13.97%	0.00%
34122-001; 001	R1	8	0.725	0.361	1.000	0.950	0.000	1.000	0.154	60.12%	20.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.29	1.15	1.43	1.35	0.886	1.46	0.061	13.38%	0.00%
34122-001; 001	R1	8	1.07	0.597	1.55	1.35	0.112	1.46	0.202	53.10%	16.72%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.600	0.950	0.950	0.950	0.950	1.000	0.900	0.950
34122-001; 001	R1	0.000	0.050	1.000	1.000	1.000	0.900	1.000	0.850

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.886	1.35	1.35	1.35	1.35	1.46	1.25	1.35
34122-001; 001	R1	0.112	0.226	1.46	1.46	1.46	1.25	1.46	1.17

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	17-2290-5503	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:35	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-002; 002 passed proportion survived	22.40%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 2	56	n/a	3	14	Exact	0.1028	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.92	2.59	0.0062	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.216289	0.216289	1	1.92	0.1872	Non-Significant Effect
Error	1.57456	0.112469	14			
Total	1.79085		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	6.55	8.89	0.0241	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.804	0.841	0.0031	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.906	0.800	1.000	0.950	0.600	1.000	0.045	13.97%	0.00%
34122-002; 002	R2	8	0.731	0.445	1.000	0.850	0.000	1.000	0.121	46.80%	19.31%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.29	1.15	1.43	1.35	0.886	1.46	0.061	13.38%	0.00%
34122-002; 002	R2	8	1.06	0.688	1.43	1.18	0.112	1.46	0.156	41.77%	18.03%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.600	0.950	0.950	0.950	0.950	1.000	0.900	0.950
34122-002; 002	R2	0.000	0.800	1.000	0.950	0.450	0.900	0.800	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.886	1.35	1.35	1.35	1.35	1.46	1.25	1.35
34122-002; 002	R2	0.112	1.11	1.46	1.35	0.735	1.25	1.11	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	08-5639-4914	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-003; 003 passed proportion survived	28.92%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 3	69	n/a	3	14	Exact	0.5524	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.5	2.59	0.0779	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.154178	0.154178	1	0.931	0.3510	Non-Significant Effect
Error	2.31868	0.16562	14			
Total	2.47286		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	10.1	8.89	0.0068	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.788	0.841	0.0019	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.906	0.800	1.000	0.950	0.600	1.000	0.045	13.97%	0.00%
34122-003; 003	R3	8	0.737	0.381	1.000	0.950	0.000	1.000	0.151	57.84%	18.62%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.29	1.15	1.43	1.35	0.886	1.46	0.061	13.38%	0.00%
34122-003; 003	R3	8	1.09	0.635	1.55	1.35	0.112	1.46	0.194	50.20%	15.22%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.600	0.950	0.950	0.950	0.950	1.000	0.900	0.950
34122-003; 003	R3	0.950	0.000	1.000	1.000	0.950	1.000	0.100	0.900

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.886	1.35	1.35	1.35	1.35	1.46	1.25	1.35
34122-003; 003	R3	1.35	0.112	1.46	1.46	1.35	1.46	0.322	1.25

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	09-6630-2478	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-004; 004 passed proportion survived	14.69%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 4	64.5	n/a	3	14	Exact	0.3373	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	3.01	2.59	0.0030	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0121814	0.0121814	1	0.203	0.6591	Non-Significant Effect
Error	0.839735	0.0599811	14			
Total	0.851917		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.03	8.89	0.1673	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.704	0.841	1.9E-04	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.906	0.800	1.000	0.950	0.600	1.000	0.045	13.97%	0.00%
34122-004; 004	R4	8	0.856	0.649	1.000	0.925	0.250	1.000	0.088	29.02%	5.52%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.29	1.15	1.43	1.35	0.886	1.46	0.061	13.38%	0.00%
34122-004; 004	R4	8	1.23	0.984	1.49	1.3	0.524	1.46	0.106	24.32%	4.28%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.600	0.950	0.950	0.950	0.950	1.000	0.900	0.950
34122-004; 004	R4	0.900	0.950	0.900	1.000	0.950	1.000	0.900	0.250

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.886	1.35	1.35	1.35	1.35	1.46	1.25	1.35
34122-004; 004	R4	1.25	1.35	1.25	1.46	1.35	1.46	1.25	0.524

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-4812-8364	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-005; 005 failed proportion survived	34.96%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 5*	2.05	1.86	0.415	8	CDF	0.0375	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.67	2.59	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.833044	0.833044	1	4.19	0.0600	Non-Significant Effect
Error	2.78587	0.198991	14			
Total	3.61892		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	12.4	8.89	0.0037	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.889	0.841	0.0547	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.906	0.800	1.000	0.950	0.600	1.000	0.045	13.97%	0.00%
34122-005; 005	R5	8	0.562	0.170	0.955	0.825	0.000	1.000	0.166	83.49%	37.93%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.29	1.15	1.43	1.35	0.886	1.46	0.061	13.38%	0.00%
34122-005; 005	R5	8	0.834	0.326	1.34	1.14	0.112	1.46	0.215	72.78%	35.38%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.600	0.950	0.950	0.950	0.950	1.000	0.900	0.950
34122-005; 005	R5	0.900	0.000	1.000	0.950	0.800	0.000	0.000	0.850

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.886	1.35	1.35	1.35	1.35	1.46	1.25	1.35
34122-005; 005	R5	1.25	0.112	1.46	1.35	1.11	0.112	0.112	1.17

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	12-9767-7345	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-006; 006 passed proportion survived	6.94%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-006; 006	62.5	n/a	3	14	Exact	0.2907	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.92	2.59	0.0062	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.000781	0.000781	1	0.038	0.8482	Non-Significant Effect
Error	0.287412	0.0205294	14			
Total	0.288193		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.65	8.89	0.2225	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.838	0.841	0.0092	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.906	0.800	1.000	0.950	0.600	1.000	0.045	13.97%	0.00%
34122-006; 006		8	0.925	0.880	0.970	0.900	0.850	1.000	0.019	5.78%	-2.07%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.29	1.15	1.43	1.35	0.886	1.46	0.061	13.38%	0.00%
34122-006; 006		8	1.3	1.22	1.39	1.25	1.17	1.46	0.0375	8.14%	-1.08%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.600	0.950	0.950	0.950	0.950	1.000	0.900	0.950
34122-006; 006		1.000	0.950	0.900	1.000	0.900	0.850	0.900	0.900

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.886	1.35	1.35	1.35	1.35	1.46	1.25	1.35
34122-006; 006		1.46	1.35	1.25	1.46	1.25	1.17	1.25	1.25

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	09-8587-2399	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-007; 007 passed proportion survived	9.46%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-007; 007	86.5	n/a	2	14	Exact	0.9879	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.57	2.59	0.0536	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0322197	0.0322197	1	1.02	0.3301	Non-Significant Effect
Error	0.443038	0.0316456	14			
Total	0.475258		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.12	8.89	0.8814	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.63	0.841	3.1E-05	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.906	0.800	1.000	0.950	0.600	1.000	0.045	13.97%	0.00%
34122-007; 007		8	0.950	0.848	1.000	1.000	0.650	1.000	0.043	12.89%	-4.83%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.29	1.15	1.43	1.35	0.886	1.46	0.061	13.38%	0.00%
34122-007; 007		8	1.38	1.23	1.53	1.46	0.938	1.46	0.0647	13.26%	-6.96%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.600	0.950	0.950	0.950	0.950	1.000	0.900	0.950
34122-007; 007		1.000	1.000	1.000	1.000	1.000	1.000	0.650	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.886	1.35	1.35	1.35	1.35	1.46	1.25	1.35
34122-007; 007		1.46	1.46	1.46	1.46	1.46	1.46	0.938	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-6843-5987	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-008; 008 failed proportion survived	9.95%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-008; 008*	4.21	1.76	0.162	14	CDF	4.4E-04	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.27	2.59	0.2097	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.603166	0.603166	1	17.7	8.7E-04	Significant Effect
Error	0.476223	0.0340159	14			
Total	1.07939		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.28	8.89	0.7507	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.945	0.841	0.4098	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.906	0.800	1.000	0.950	0.600	1.000	0.045	13.97%	0.00%
34122-008; 008		8	0.606	0.456	0.757	0.575	0.400	0.850	0.064	29.72%	33.10%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.29	1.15	1.43	1.35	0.886	1.46	0.061	13.38%	0.00%
34122-008; 008		8	0.902	0.738	1.07	0.861	0.685	1.17	0.0691	21.68%	30.10%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.600	0.950	0.950	0.950	0.950	1.000	0.900	0.950
34122-008; 008		0.850	0.700	0.400	0.600	0.850	0.550	0.400	0.500

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.886	1.35	1.35	1.35	1.35	1.46	1.25	1.35
34122-008; 008		1.17	0.991	0.685	0.886	1.17	0.835	0.685	0.785

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	05-0818-2674	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-009; 009 passed proportion survived	7.71%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-009; 009	80.5	n/a	3	14	Exact	0.9389	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.71	2.59	0.0243	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0284744	0.0284744	1	1.2	0.2918	Non-Significant Effect
Error	0.332158	0.0237256	14			
Total	0.360633		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.69	8.89	0.5062	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.758	0.841	7.9E-04	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.906	0.800	1.000	0.950	0.600	1.000	0.045	13.97%	0.00%
34122-009; 009		8	0.956	0.895	1.000	1.000	0.800	1.000	0.026	7.62%	-5.52%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.29	1.15	1.43	1.35	0.886	1.46	0.061	13.38%	0.00%
34122-009; 009		8	1.37	1.26	1.49	1.46	1.11	1.46	0.047	9.67%	-6.54%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.600	0.950	0.950	0.950	0.950	1.000	0.900	0.950
34122-009; 009		1.000	1.000	1.000	1.000	1.000	0.900	0.800	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.886	1.35	1.35	1.35	1.35	1.46	1.25	1.35
34122-009; 009		1.46	1.46	1.46	1.46	1.46	1.25	1.11	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	12-6414-2147	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-010; 010 passed proportion survived	4.92%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-010; 010	0.507	1.77	0.093	13	CDF	0.3104	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0026567	0.0026567	1	0.257	0.6208	Non-Significant Effect
Error	0.134478	0.0103444	13			
Total	0.137134		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	4.36	10.8	0.0924	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.907	0.833	0.1234	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	7	0.950	0.923	0.977	0.950	0.900	1.000	0.011	3.04%	0.00%
34122-010; 010		8	0.931	0.877	0.986	0.925	0.850	1.000	0.023	6.99%	1.97%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	7	1.35	1.29	1.4	1.35	1.25	1.46	0.0229	4.50%	0.00%
34122-010; 010		8	1.32	1.22	1.43	1.3	1.17	1.46	0.0448	9.59%	1.98%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	Outlier	0.950	0.950	0.950	0.950	1.000	0.900	0.950
34122-010; 010		1.000	1.000	0.850	0.900	0.850	0.900	1.000	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	1.35	1.35	1.35	1.35	1.46	1.25	1.35	
34122-010; 010		1.46	1.46	1.17	1.25	1.17	1.25	1.46	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-9952-1467	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-006; 006 passed proportion survived	40.98%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-006; 006	68.5	n/a	3	14	Exact	0.5272	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.43	2.59	0.1073	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.210991	0.210991	1	1.25	0.2817	Non-Significant Effect
Error	2.35674	0.168338	14			
Total	2.56773		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	28.9	8.89	2.4E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.796	0.841	0.0024	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	8	0.725	0.361	1.000	0.950	0.000	1.000	0.154	60.12%	0.00%
34122-006; 006		8	0.925	0.880	0.970	0.900	0.850	1.000	0.019	5.78%	-27.59%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	8	1.07	0.597	1.55	1.35	0.112	1.46	0.202	53.10%	0.00%
34122-006; 006		8	1.3	1.22	1.39	1.25	1.17	1.46	0.0375	8.14%	-21.38%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.000	0.050	1.000	1.000	1.000	0.900	1.000	0.850
34122-006; 006		1.000	0.950	0.900	1.000	0.900	0.850	0.900	0.900

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.112	0.226	1.46	1.46	1.46	1.25	1.46	1.17
34122-006; 006		1.46	1.35	1.25	1.46	1.25	1.17	1.25	1.25

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	15-9429-2198	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-007; 007 passed proportion survived	42.58%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-007; 007	78	n/a	1	14	Exact	0.9079	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.35	2.59	0.1493	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.373187	0.373187	1	2.08	0.1713	Non-Significant Effect
Error	2.51237	0.179455	14			
Total	2.88555		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	9.72	8.89	0.0077	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.772	0.841	0.0012	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	8	0.725	0.361	1.000	0.950	0.000	1.000	0.154	60.12%	0.00%
34122-007; 007		8	0.950	0.848	1.000	1.000	0.650	1.000	0.043	12.89%	-31.03%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	8	1.07	0.597	1.55	1.35	0.112	1.46	0.202	53.10%	0.00%
34122-007; 007		8	1.38	1.23	1.53	1.46	0.938	1.46	0.0647	13.26%	-28.43%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.000	0.050	1.000	1.000	1.000	0.900	1.000	0.850
34122-007; 007		1.000	1.000	1.000	1.000	1.000	1.000	0.650	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.112	0.226	1.46	1.46	1.46	1.25	1.46	1.17
34122-007; 007		1.46	1.46	1.46	1.46	1.46	1.46	0.938	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	12-9585-4839	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-008; 008 passed proportion survived	42.92%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-008; 008	53	n/a	1	14	Exact	0.0583	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.34	2.59	0.1592	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.119195	0.119195	1	0.656	0.4317	Non-Significant Effect
Error	2.54555	0.181825	14			
Total	2.66474		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	8.51	8.89	0.0114	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.834	0.841	0.0079	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	8	0.725	0.361	1.000	0.950	0.000	1.000	0.154	60.12%	0.00%
34122-008; 008		8	0.606	0.456	0.757	0.575	0.400	0.850	0.064	29.72%	16.38%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	8	1.07	0.597	1.55	1.35	0.112	1.46	0.202	53.10%	0.00%
34122-008; 008		8	0.902	0.738	1.07	0.861	0.685	1.17	0.0691	21.68%	16.07%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.000	0.050	1.000	1.000	1.000	0.900	1.000	0.850
34122-008; 008		0.850	0.700	0.400	0.600	0.850	0.550	0.400	0.500

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.112	0.226	1.46	1.46	1.46	1.25	1.46	1.17
34122-008; 008		1.17	0.991	0.685	0.886	1.17	0.835	0.685	0.785

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	05-6068-9190	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-009; 009 passed proportion survived	41.45%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-009; 009	75.5	n/a	2	14	Exact	0.8198	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.41	2.59	0.1186	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.360163	0.360163	1	2.1	0.1694	Non-Significant Effect
Error	2.40148	0.171535	14			
Total	2.76165		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	18.4	8.89	0.0010	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.794	0.841	0.0023	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	8	0.725	0.361	1.000	0.950	0.000	1.000	0.154	60.12%	0.00%
34122-009; 009		8	0.956	0.895	1.000	1.000	0.800	1.000	0.026	7.62%	-31.90%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	8	1.07	0.597	1.55	1.35	0.112	1.46	0.202	53.10%	0.00%
34122-009; 009		8	1.37	1.26	1.49	1.46	1.11	1.46	0.047	9.67%	-27.93%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.000	0.050	1.000	1.000	1.000	0.900	1.000	0.850
34122-009; 009		1.000	1.000	1.000	1.000	1.000	0.900	0.800	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.112	0.226	1.46	1.46	1.46	1.25	1.46	1.17
34122-009; 009		1.46	1.46	1.46	1.46	1.46	1.25	1.11	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	05-6223-6292	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-010; 010 passed proportion survived	41.33%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-010; 010	70	n/a	3	14	Exact	0.6006	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.41	2.59	0.1157	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.2435	0.2435	1	1.43	0.2522	Non-Significant Effect
Error	2.3903	0.170736	14			
Total	2.6338		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	20.3	8.89	7.6E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.807	0.841	0.0034	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	8	0.725	0.361	1.000	0.950	0.000	1.000	0.154	60.12%	0.00%
34122-010; 010		8	0.931	0.877	0.986	0.925	0.850	1.000	0.023	6.99%	-28.45%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	8	1.07	0.597	1.55	1.35	0.112	1.46	0.202	53.10%	0.00%
34122-010; 010		8	1.32	1.22	1.43	1.3	1.17	1.46	0.0448	9.59%	-22.97%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.000	0.050	1.000	1.000	1.000	0.900	1.000	0.850
34122-010; 010		1.000	1.000	0.850	0.900	0.850	0.900	1.000	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.112	0.226	1.46	1.46	1.46	1.25	1.46	1.17
34122-010; 010		1.46	1.46	1.17	1.25	1.17	1.25	1.46	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-0074-4964	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-006; 006 passed proportion survived	33.10%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-006; 006	79	n/a	3	14	Exact	0.8890	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	3.05	2.59	0.0021	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.243064	0.243064	1	2.36	0.1471	Non-Significant Effect
Error	1.44479	0.103199	14			
Total	1.68785		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	17.3	8.89	0.0013	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.827	0.841	0.0063	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	8	0.731	0.445	1.000	0.850	0.000	1.000	0.121	46.80%	0.00%
34122-006; 006		8	0.925	0.880	0.970	0.900	0.850	1.000	0.019	5.78%	-26.50%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	8	1.06	0.688	1.43	1.18	0.112	1.46	0.156	41.77%	0.00%
34122-006; 006		8	1.3	1.22	1.39	1.25	1.17	1.46	0.0375	8.14%	-23.31%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.000	0.800	1.000	0.950	0.450	0.900	0.800	0.950
34122-006; 006		1.000	0.950	0.900	1.000	0.900	0.850	0.900	0.900

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.112	1.11	1.46	1.35	0.735	1.25	1.11	1.35
34122-006; 006		1.46	1.35	1.25	1.46	1.25	1.17	1.25	1.25

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	07-9455-9698	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-007; 007 passed proportion survived	35.13%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-007; 007	89	n/a	2	14	Exact	0.9928	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.89	2.59	0.0074	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.415468	0.415468	1	3.63	0.0773	Non-Significant Effect
Error	1.60042	0.114315	14			
Total	2.01588		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.83	8.89	0.0332	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.792	0.841	0.0022	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	8	0.731	0.445	1.000	0.850	0.000	1.000	0.121	46.80%	0.00%
34122-007; 007		8	0.950	0.848	1.000	1.000	0.650	1.000	0.043	12.89%	-29.91%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	8	1.06	0.688	1.43	1.18	0.112	1.46	0.156	41.77%	0.00%
34122-007; 007		8	1.38	1.23	1.53	1.46	0.938	1.46	0.0647	13.26%	-30.48%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.000	0.800	1.000	0.950	0.450	0.900	0.800	0.950
34122-007; 007		1.000	1.000	1.000	1.000	1.000	1.000	0.650	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.112	1.11	1.46	1.35	0.735	1.25	1.11	1.35
34122-007; 007		1.46	1.46	1.46	1.46	1.46	1.46	0.938	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	15-7942-7153	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-008; 008 passed proportion survived	35.55%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-008; 008	0.912	1.76	0.301	14	CDF	0.1886	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.86	2.59	0.0091	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0970749	0.0970749	1	0.832	0.3772	Non-Significant Effect
Error	1.6336	0.116686	14			
Total	1.73068		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.1	8.89	0.0473	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.869	0.841	0.0267	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	8	0.731	0.445	1.000		0.000	1.000	0.121	46.80%	0.00%
34122-008; 008		8	0.606	0.456	0.757		0.400	0.850	0.064	29.72%	17.09%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	8	1.06	0.688	1.43		0.112	1.46	0.156	41.77%	0.00%
34122-008; 008		8	0.902	0.738	1.07		0.685	1.17	0.0691	21.68%	14.73%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.000	0.800	1.000	0.950	0.450	0.900	0.800	0.950
34122-008; 008		0.850	0.700	0.400	0.600	0.850	0.550	0.400	0.500

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	13-6388-8409	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-008; 008 failed proportion survived	15.96%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-008; 008*	2.59	1.77	0.199	13	CDF	0.0112	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.315818	0.315818	1	6.71	0.0224	Significant Effect
Error	0.611996	0.0470766	13			
Total	0.927814		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.5	9.16	0.6042	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.946	0.833	0.4568	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	0.836	0.663	1.000	0.900	0.450	1.000	0.071	22.31%	0.00%
34122-008; 008		8	0.606	0.456	0.757	0.575	0.400	0.850	0.064	29.72%	27.46%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	1.19	0.971	1.41	1.25	0.735	1.46	0.0905	20.09%	0.00%
34122-008; 008		8	0.902	0.738	1.07	0.861	0.685	1.17	0.0691	21.68%	24.39%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	Outlier	0.800	1.000	0.950	0.450	0.900	0.800	0.950
34122-008; 008		0.850	0.700	0.400	0.600	0.850	0.550	0.400	0.500

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	1.11	1.46	1.35	0.735	1.25	1.11	1.35	
34122-008; 008		1.17	0.991	0.685	0.886	1.17	0.835	0.685	0.785

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-3008-1551	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-009; 009 passed proportion survived	33.70%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-009; 009	87	n/a	4	14	Exact	0.9845	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	3	2.59	0.0032	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.401719	0.401719	1	3.78	0.0724	Non-Significant Effect
Error	1.48954	0.106395	14			
Total	1.89125		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	11.1	8.89	0.0052	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.819	0.841	0.0050	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	8	0.731	0.445	1.000	0.850	0.000	1.000	0.121	46.80%	0.00%
34122-009; 009		8	0.956	0.895	1.000	1.000	0.800	1.000	0.026	7.62%	-30.77%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	8	1.06	0.688	1.43	1.18	0.112	1.46	0.156	41.77%	0.00%
34122-009; 009		8	1.37	1.26	1.49	1.46	1.11	1.46	0.047	9.67%	-29.97%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.000	0.800	1.000	0.950	0.450	0.900	0.800	0.950
34122-009; 009		1.000	1.000	1.000	1.000	1.000	0.900	0.800	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.112	1.11	1.46	1.35	0.735	1.25	1.11	1.35
34122-009; 009		1.46	1.46	1.46	1.46	1.46	1.25	1.11	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	09-2669-4814	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-009; 009 passed proportion survived	13.26%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-009; 009	-1.85	1.77	0.174	13	CDF	0.9566	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.123446	0.123446	1	3.43	0.0869	Non-Significant Effect
Error	0.467931	0.0359947	13			
Total	0.591377		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.25	9.16	0.1484	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.894	0.833	0.0778	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	0.836	0.663	1.000	0.900	0.450	1.000	0.071	22.31%	0.00%
34122-009; 009		8	0.956	0.895	1.000	1.000	0.800	1.000	0.026	7.62%	-14.42%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	1.19	0.971	1.41	1.25	0.735	1.46	0.0905	20.09%	0.00%
34122-009; 009		8	1.37	1.26	1.49	1.46	1.11	1.46	0.047	9.67%	-15.25%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	Outlier	0.800	1.000	0.950	0.450	0.900	0.800	0.950
34122-009; 009		1.000	1.000	1.000	1.000	1.000	0.900	0.800	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	1.11	1.46	1.35	0.735	1.25	1.11	1.35	
34122-009; 009		1.46	1.46	1.46	1.46	1.46	1.25	1.11	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	14-3831-3328	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-010; 010 passed proportion survived	35.73%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-010; 010	-1.62	1.86	0.302	8	CDF	0.9283	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	3.01	2.59	0.0029	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.27787	0.27787	1	2.63	0.1271	Non-Significant Effect
Error	1.47835	0.105596	14			
Total	1.75622		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	12.2	8.89	0.0039	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.842	0.841	0.0105	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	8	0.731	0.445	1.000	0.850	0.000	1.000	0.121	46.80%	0.00%
34122-010; 010		8	0.931	0.877	0.986	0.925	0.850	1.000	0.023	6.99%	-27.35%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	8	1.06	0.688	1.43	1.18	0.112	1.46	0.156	41.77%	0.00%
34122-010; 010		8	1.32	1.22	1.43	1.3	1.17	1.46	0.0448	9.59%	-24.92%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.000	0.800	1.000	0.950	0.450	0.900	0.800	0.950
34122-010; 010		1.000	1.000	0.850	0.900	0.850	0.900	1.000	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.112	1.11	1.46	1.35	0.735	1.25	1.11	1.35
34122-010; 010		1.46	1.46	1.17	1.25	1.17	1.25	1.46	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	05-3729-9854	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-006; 006 passed proportion survived	37.61%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-006; 006	65	n/a	3	14	Exact	0.4141	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.57	2.59	0.0543	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.176905	0.176905	1	1.13	0.3055	Non-Significant Effect
Error	2.18891	0.156351	14			
Total	2.36582		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	26.8	8.89	3.1E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.796	0.841	0.0024	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	8	0.737	0.381	1.000	0.950	0.000	1.000	0.151	57.84%	0.00%
34122-006; 006		8	0.925	0.880	0.970	0.900	0.850	1.000	0.019	5.78%	-25.42%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	8	1.09	0.635	1.55	1.35	0.112	1.46	0.194	50.20%	0.00%
34122-006; 006		8	1.3	1.22	1.39	1.25	1.17	1.46	0.0375	8.14%	-19.23%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.950	0.000	1.000	1.000	0.950	1.000	0.100	0.900
34122-006; 006		1.000	0.950	0.900	1.000	0.900	0.850	0.900	0.900

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	1.35	0.112	1.46	1.46	1.35	1.46	0.322	1.25
34122-006; 006		1.46	1.35	1.25	1.46	1.25	1.17	1.25	1.25

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-6999-5761	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-007; 007 passed proportion survived	39.25%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-007; 007	81	n/a	2	14	Exact	0.9406	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.48	2.59	0.0832	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.32736	0.32736	1	1.95	0.1838	Non-Significant Effect
Error	2.34454	0.167467	14			
Total	2.6719		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	9	8.89	0.0096	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.774	0.841	0.0012	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	8	0.737	0.381	1.000	0.950	0.000	1.000	0.151	57.84%	0.00%
34122-007; 007		8	0.950	0.848	1.000	1.000	0.650	1.000	0.043	12.89%	-28.81%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	8	1.09	0.635	1.55	1.35	0.112	1.46	0.194	50.20%	0.00%
34122-007; 007		8	1.38	1.23	1.53	1.46	0.938	1.46	0.0647	13.26%	-26.16%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.950	0.000	1.000	1.000	0.950	1.000	0.100	0.900
34122-007; 007		1.000	1.000	1.000	1.000	1.000	1.000	0.650	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	1.35	0.112	1.46	1.46	1.35	1.46	0.322	1.25
34122-007; 007		1.46	1.46	1.46	1.46	1.46	1.46	0.938	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	06-7712-3733	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-008; 008 failed proportion survived	39.59%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-008; 008*	52	n/a	0	14	Exact	0.0486	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.47	2.59	0.0902	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.147443	0.147443	1	0.868	0.3673	Non-Significant Effect
Error	2.37772	0.169837	14			
Total	2.52516		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.88	8.89	0.0142	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.826	0.841	0.0063	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	8	0.737	0.381	1.000	0.950	0.000	1.000	0.151	57.84%	0.00%
34122-008; 008		8	0.606	0.456	0.757	0.575	0.400	0.850	0.064	29.72%	17.80%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	8	1.09	0.635	1.55	1.35	0.112	1.46	0.194	50.20%	0.00%
34122-008; 008		8	0.902	0.738	1.07	0.861	0.685	1.17	0.0691	21.68%	17.55%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.950	0.000	1.000	1.000	0.950	1.000	0.100	0.900
34122-008; 008		0.850	0.700	0.400	0.600	0.850	0.550	0.400	0.500

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	1.35	0.112	1.46	1.46	1.35	1.46	0.322	1.25
34122-008; 008		1.17	0.991	0.685	0.886	1.17	0.835	0.685	0.785

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	09-1225-2040	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-009; 009 passed proportion survived	38.09%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-009; 009	77	n/a	3	14	Exact	0.8514	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.54	2.59	0.0619	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.315169	0.315169	1	1.98	0.1817	Non-Significant Effect
Error	2.23366	0.159547	14			
Total	2.54883		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	17.1	8.89	0.0013	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.798	0.841	0.0026	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	8	0.737	0.381	1.000	0.950	0.000	1.000	0.151	57.84%	0.00%
34122-009; 009		8	0.956	0.895	1.000	1.000	0.800	1.000	0.026	7.62%	-29.66%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	8	1.09	0.635	1.55	1.35	0.112	1.46	0.194	50.20%	0.00%
34122-009; 009		8	1.37	1.26	1.49	1.46	1.11	1.46	0.047	9.67%	-25.66%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.950	0.000	1.000	1.000	0.950	1.000	0.100	0.900
34122-009; 009		1.000	1.000	1.000	1.000	1.000	0.900	0.800	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	1.35	0.112	1.46	1.46	1.35	1.46	0.322	1.25
34122-009; 009		1.46	1.46	1.46	1.46	1.46	1.25	1.11	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	06-1381-4683	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-010; 010 passed proportion survived	37.97%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-010; 010	68.5	n/a	3	14	Exact	0.5221	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.55	2.59	0.0599	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.20677	0.20677	1	1.3	0.2729	Non-Significant Effect
Error	2.22247	0.158748	14			
Total	2.42924		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	18.8	8.89	9.8E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.806	0.841	0.0033	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	8	0.737	0.381	1.000	0.950	0.000	1.000	0.151	57.84%	0.00%
34122-010; 010		8	0.931	0.877	0.986	0.925	0.850	1.000	0.023	6.99%	-26.27%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	8	1.09	0.635	1.55	1.35	0.112	1.46	0.194	50.20%	0.00%
34122-010; 010		8	1.32	1.22	1.43	1.3	1.17	1.46	0.0448	9.59%	-20.79%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.950	0.000	1.000	1.000	0.950	1.000	0.100	0.900
34122-010; 010		1.000	1.000	0.850	0.900	0.850	0.900	1.000	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	1.35	0.112	1.46	1.46	1.35	1.46	0.322	1.25
34122-010; 010		1.46	1.46	1.17	1.25	1.17	1.25	1.46	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	13-3322-7132	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-006; 006 passed proportion survived	4.86%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-006; 006	0.623	1.77	0.092	13	CDF	0.2721	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0039312	0.0039312	1	0.388	0.5443	Non-Significant Effect
Error	0.131814	0.0101395	13			
Total	0.135745		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.27	10.8	0.7831	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.878	0.833	0.0450	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	7	0.943	0.901	0.984	0.950	0.900	1.000	0.017	4.77%	0.00%
34122-006; 006		8	0.925	0.880	0.970	0.900	0.850	1.000	0.019	5.78%	1.89%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	7	1.34	1.25	1.42	1.35	1.25	1.46	0.0355	7.03%	0.00%
34122-006; 006		8	1.3	1.22	1.39	1.25	1.17	1.46	0.0375	8.14%	2.43%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.900	0.950	0.900	1.000	0.950	1.000	0.900	Outlier
34122-006; 006		1.000	0.950	0.900	1.000	0.900	0.850	0.900	0.900

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1.25	1.35	1.25	1.46	1.35	1.46	1.25	
34122-006; 006		1.46	1.35	1.25	1.46	1.25	1.17	1.25	1.25

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	13-3860-2888	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-007; 007 passed proportion survived	15.63%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-007; 007	84	n/a	3	14	Exact	0.9688	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.96	2.59	0.0044	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0840233	0.0840233	1	1.36	0.2632	Non-Significant Effect
Error	0.865591	0.0618279	14			
Total	0.949614		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.69	8.89	0.2147	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.674	0.841	8.8E-05	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.856	0.649	1.000	0.925	0.250	1.000	0.088	29.02%	0.00%
34122-007; 007		8	0.950	0.848	1.000	1.000	0.650	1.000	0.043	12.89%	-10.95%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	1.23	0.984	1.49	1.3	0.524	1.46	0.106	24.32%	0.00%
34122-007; 007		8	1.38	1.23	1.53	1.46	0.938	1.46	0.0647	13.26%	-11.74%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.900	0.950	0.900	1.000	0.950	1.000	0.900	0.250
34122-007; 007		1.000	1.000	1.000	1.000	1.000	1.000	0.650	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1.25	1.35	1.25	1.46	1.35	1.46	1.25	0.524
34122-007; 007		1.46	1.46	1.46	1.46	1.46	1.46	0.938	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	19-5811-1596	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-008; 008 failed proportion survived	16.07%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-008; 008*	2.63	1.76	0.223	14	CDF	0.0099	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.91	2.59	0.0068	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.443913	0.443913	1	6.91	0.0198	Significant Effect
Error	0.898775	0.0641982	14			
Total	1.34269		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.36	8.89	0.2803	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.856	0.841	0.0169	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.856	0.649	1.000	0.925	0.250	1.000	0.088	29.02%	0.00%
34122-008; 008		8	0.606	0.456	0.757	0.575	0.400	0.850	0.064	29.72%	29.20%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	1.23	0.984	1.49	1.3	0.524	1.46	0.106	24.32%	0.00%
34122-008; 008		8	0.902	0.738	1.07	0.861	0.685	1.17	0.0691	21.68%	26.98%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.900	0.950	0.900	1.000	0.950	1.000	0.900	0.250
34122-008; 008		0.850	0.700	0.400	0.600	0.850	0.550	0.400	0.500

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1.25	1.35	1.25	1.46	1.35	1.46	1.25	0.524
34122-008; 008		1.17	0.991	0.685	0.886	1.17	0.835	0.685	0.785

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	08-6096-9156	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-009; 009 passed proportion survived	14.13%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-009; 009	79.5	n/a	4	14	Exact	0.9085	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	3.17	2.59	5.9E-04	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.077904	0.077904	1	1.45	0.2493	Non-Significant Effect
Error	0.754711	0.0539079	14			
Total	0.832615		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.11	8.89	0.0472	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.73	0.841	3.7E-04	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.856	0.649	1.000	0.925	0.250	1.000	0.088	29.02%	0.00%
34122-009; 009		8	0.956	0.895	1.000	1.000	0.800	1.000	0.026	7.62%	-11.68%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	1.23	0.984	1.49	1.3	0.524	1.46	0.106	24.32%	0.00%
34122-009; 009		8	1.37	1.26	1.49	1.46	1.11	1.46	0.047	9.67%	-11.30%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.900	0.950	0.900	1.000	0.950	1.000	0.900	0.250
34122-009; 009		1.000	1.000	1.000	1.000	1.000	0.900	0.800	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1.25	1.35	1.25	1.46	1.35	1.46	1.25	0.524
34122-009; 009		1.46	1.46	1.46	1.46	1.46	1.25	1.11	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	17-7681-2041	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-010; 010 passed proportion survived	13.97%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-010; 010	69	n/a	4	14	Exact	0.5859	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	3.19	2.59	4.5E-04	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0297335	0.0297335	1	0.56	0.4667	Non-Significant Effect
Error	0.743526	0.053109	14			
Total	0.773259		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.62	8.89	0.0366	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.766	0.841	9.8E-04	Non-Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.856	0.649	1.000	0.925	0.250	1.000	0.088	29.02%	0.00%
34122-010; 010		8	0.931	0.877	0.986	0.925	0.850	1.000	0.023	6.99%	-8.76%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	1.23	0.984	1.49	1.3	0.524	1.46	0.106	24.32%	0.00%
34122-010; 010		8	1.32	1.22	1.43	1.3	1.17	1.46	0.0448	9.59%	-6.98%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.900	0.950	0.900	1.000	0.950	1.000	0.900	0.250
34122-010; 010		1.000	1.000	0.850	0.900	0.850	0.900	1.000	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1.25	1.35	1.25	1.46	1.35	1.46	1.25	0.524
34122-010; 010		1.46	1.46	1.17	1.25	1.17	1.25	1.46	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-0989-2912	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-006; 006 passed proportion survived	70.30%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-006; 006	-2.16	1.89	0.413	7	CDF	0.9662	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.71	2.59	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.884839	0.884839	1	4.66	0.0486	Significant Effect
Error	2.6561	0.189722	14			
Total	3.54094		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	32.7	8.89	1.6E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.901	0.841	0.0845	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	8	0.562	0.170	0.955	0.825	0.000	1.000	0.166	83.49%	0.00%
34122-006; 006		8	0.925	0.880	0.970	0.900	0.850	1.000	0.019	5.78%	-64.44%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	8	0.834	0.326	1.34	1.14	0.112	1.46	0.215	72.78%	0.00%
34122-006; 006		8	1.3	1.22	1.39	1.25	1.17	1.46	0.0375	8.14%	-56.42%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.900	0.000	1.000	0.950	0.800	0.000	0.000	0.850
34122-006; 006		1.000	0.950	0.900	1.000	0.900	0.850	0.900	0.900

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	1.25	0.112	1.46	1.35	1.11	0.112	0.112	1.17
34122-006; 006		1.46	1.35	1.25	1.46	1.25	1.17	1.25	1.25

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	08-9729-8219	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-007; 007 passed proportion survived	70.84%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-007; 007	-2.44	1.86	0.417	8	CDF	0.9796	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.67	2.59	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.19293	1.19293	1	5.94	0.0287	Significant Effect
Error	2.81173	0.200838	14			
Total	4.00465		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	11	8.89	0.0053	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.876	0.841	0.0337	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	8	0.562	0.170	0.955	0.825	0.000	1.000	0.166	83.49%	0.00%
34122-007; 007		8	0.950	0.848	1.000	1.000	0.650	1.000	0.043	12.89%	-68.89%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	8	0.834	0.326	1.34	1.14	0.112	1.46	0.215	72.78%	0.00%
34122-007; 007		8	1.38	1.23	1.53	1.46	0.938	1.46	0.0647	13.26%	-65.51%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.900	0.000	1.000	0.950	0.800	0.000	0.000	0.850
34122-007; 007		1.000	1.000	1.000	1.000	1.000	1.000	0.650	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	1.25	0.112	1.46	1.35	1.11	0.112	0.112	1.17
34122-007; 007		1.46	1.46	1.46	1.46	1.46	1.46	0.938	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	20-8068-0399	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-008; 008 passed proportion survived	71.16%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-008; 008	-0.302	1.86	0.419	8	CDF	0.6148	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.66	2.59	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0185164	0.0185164	1	0.0911	0.7672	Non-Significant Effect
Error	2.84491	0.203208	14			
Total	2.86343		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	9.63	8.89	0.0079	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.915	0.841	0.1386	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	8	0.562	0.170	0.955	0.825	0.000	1.000	0.166	83.49%	0.00%
34122-008; 008		8	0.606	0.456	0.757	0.575	0.400	0.850	0.064	29.72%	-7.78%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	8	0.834	0.326	1.34	1.14	0.112	1.46	0.215	72.78%	0.00%
34122-008; 008		8	0.902	0.738	1.07	0.861	0.685	1.17	0.0691	21.68%	-8.16%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.900	0.000	1.000	0.950	0.800	0.000	0.000	0.850
34122-008; 008		0.850	0.700	0.400	0.600	0.850	0.550	0.400	0.500

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	1.25	0.112	1.46	1.35	1.11	0.112	0.112	1.17
34122-008; 008		1.17	0.991	0.685	0.886	1.17	0.835	0.685	0.785

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	04-3500-7719	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-009; 009 passed proportion survived	70.76%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-009; 009	-2.46	1.89	0.416	7	CDF	0.9783	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.7	2.59	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.16955	1.16955	1	6.06	0.0274	Significant Effect
Error	2.70085	0.192918	14			
Total	3.8704		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	20.9	8.89	7.0E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.901	0.841	0.0831	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	8	0.562	0.170	0.955	0.825	0.000	1.000	0.166	83.49%	0.00%
34122-009; 009		8	0.956	0.895	1.000	1.000	0.800	1.000	0.026	7.62%	-70.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	8	0.834	0.326	1.34	1.14	0.112	1.46	0.215	72.78%	0.00%
34122-009; 009		8	1.37	1.26	1.49	1.46	1.11	1.46	0.047	9.67%	-64.86%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.900	0.000	1.000	0.950	0.800	0.000	0.000	0.850
34122-009; 009		1.000	1.000	1.000	1.000	1.000	0.900	0.800	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	1.25	0.112	1.46	1.35	1.11	0.112	0.112	1.17
34122-009; 009		1.46	1.46	1.46	1.46	1.46	1.25	1.11	1.35

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	03-2528-5410	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	34122-010; 010 passed proportion survived	70.64%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-010; 010	-2.22	1.89	0.415	7	CDF	0.9692	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.7	2.59	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.950191	0.950191	1	4.95	0.0431	Significant Effect
Error	2.68966	0.192119	14			
Total	3.63985		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	22.9	8.89	5.1E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.91	0.841	0.1174	Normal Distribution

Proportion Survived Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	8	0.562	0.170	0.955	0.825	0.000	1.000	0.166	83.49%	0.00%
34122-010; 010		8	0.931	0.877	0.986	0.925	0.850	1.000	0.023	6.99%	-65.56%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	8	0.834	0.326	1.34	1.14	0.112	1.46	0.215	72.78%	0.00%
34122-010; 010		8	1.32	1.22	1.43	1.3	1.17	1.46	0.0448	9.59%	-58.46%

Proportion Survived Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.900	0.000	1.000	0.950	0.800	0.000	0.000	0.850
34122-010; 010		1.000	1.000	0.850	0.900	0.850	0.900	1.000	0.950

Angular (Corrected) Transformed Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	1.25	0.112	1.46	1.35	1.11	0.112	0.112	1.17
34122-010; 010		1.46	1.46	1.17	1.25	1.17	1.25	1.46	1.35

28 day *Leptocheirus plumulosus* Survival, Growth and Reproduction Sediment Evaluation

CETIS™ Summary, Ad Hoc Query and Analytical Reports

Dry Weight Statistical Analysis

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h		
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d		
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d		
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d		
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h		
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
17-9446-4246	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.0033	34122-001; 001 failed mean dry weight-mg	1
11-1288-3692	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.0085	34122-002; 002 failed mean dry weight-mg	1
19-1284-5805	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.0167	34122-003; 003 failed mean dry weight-mg	1
21-2837-3249	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.2690	34122-003; 003 passed mean dry weight-	1
03-3516-5371	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.1408	34122-004; 004 passed mean dry weight-	1
11-8135-8185	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.0784	34122-005; 005 passed mean dry weight-	1
00-3100-9806	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.0752	34122-006; 006 passed mean dry weight-	1
00-5552-0648	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.1218	34122-006; 006 passed mean dry weight-	1
05-5846-0227	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.3037	34122-006; 006 passed mean dry weight-	1
07-1404-3662	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.3392	34122-006; 006 passed mean dry weight-	1
12-2610-5934	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.0041	34122-006; 006 failed mean dry weight-mg	1
14-7615-0285	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.1275	34122-006; 006 passed mean dry weight-	1
20-2580-5867	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.5095	34122-006; 006 passed mean dry weight-	1
06-5028-4005	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.6724	34122-007; 007 passed mean dry weight-	1
10-0696-2817	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.1393	34122-007; 007 passed mean dry weight-	1
11-9111-1535	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.9195	34122-007; 007 passed mean dry weight-	1
14-0662-8202	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.5227	34122-007; 007 passed mean dry weight-	1
16-6439-6006	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.9497	34122-007; 007 passed mean dry weight-	1
19-4857-6800	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.9795	34122-007; 007 passed mean dry weight-	1
20-4850-5684	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.6452	34122-007; 007 passed mean dry weight-	1
08-5913-8148	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.4351	34122-008; 008 passed mean dry weight-	1
11-8955-1759	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	4.2E-04	34122-008; 008 failed mean dry weight-mg	1
16-5821-5843	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.2377	34122-008; 008 passed mean dry weight-	1
17-3363-1627	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.2042	34122-008; 008 passed mean dry weight-	1

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test **Enthalpy Analytical, LLC**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
19-3135-8976	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.0752	34122-008; 008 passed mean dry weight-	1
19-4915-4491	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.0909	34122-008; 008 passed mean dry weight-	1
21-0179-7293	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.0156	34122-008; 008 failed mean dry weight-mg	1
04-5613-3394	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.9952	34122-009; 009 passed mean dry weight-	1
05-8184-9564	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.9997	34122-009; 009 passed mean dry weight-	1
09-3336-5311	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.9855	34122-009; 009 passed mean dry weight-	1
11-0092-1963	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.9932	34122-009; 009 passed mean dry weight-	1
12-4410-8576	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.9966	34122-009; 009 passed mean dry weight-	1
17-9650-2620	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	0.9995	34122-009; 009 passed mean dry weight-	1
03-4639-0704	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	2.5E-04	34122-010; 010 failed mean dry weight-mg	1
08-7054-2640	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	7.8E-04	34122-010; 010 failed mean dry weight-mg	1
17-4518-3112	Mean Dry Weight-mg	Equal Variance t Two-Sample Test	1.2E-05	34122-010; 010 failed mean dry weight-mg	1
00-6807-6144	Mean Dry Weight-mg	Unequal Variance t Two-Sample Test	0.0349	34122-010; 010 failed mean dry weight-mg	1
05-3541-8214	Mean Dry Weight-mg	Unequal Variance t Two-Sample Test	0.2065	34122-010; 010 passed mean dry weight-	1
10-8605-9306	Mean Dry Weight-mg	Unequal Variance t Two-Sample Test	0.0876	34122-010; 010 passed mean dry weight-	1
16-7027-5572	Mean Dry Weight-mg	Unequal Variance t Two-Sample Test	0.0941	34122-010; 010 passed mean dry weight-	1
18-8579-2717	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.0469	34122-010; 010 failed mean dry weight-mg	1
20-0004-0470	Mean Dry Weight-mg	Wilcoxon Rank Sum Two-Sample Test	0.0103	34122-010; 010 failed mean dry weight-mg	1

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
34122-000; 000	LC	8	1.07	0.926	1.21	0.846	1.38	0.061	0.173	16.13%	0.00%
34122-001; 001	R1	7	0.746	0.547	0.946	0.451	1.04	0.0817	0.216	28.95%	30.25%
34122-002; 002	R2	7	0.799	0.604	0.994	0.388	1.03	0.0797	0.211	26.41%	25.34%
34122-003; 003	R3	7	0.963	0.555	1.37	0.494	1.85	0.167	0.442	45.83%	9.96%
34122-004; 004	R4	8	0.924	0.65	1.2	0.294	1.22	0.116	0.327	35.41%	13.69%
34122-005; 005	R5	5	0.932	0.765	1.1	0.743	1.07	0.06	0.134	14.39%	12.93%
34122-006; 006		8	0.749	0.549	0.949	0.362	1.12	0.0845	0.239	31.90%	29.98%
34122-007; 007		8	0.973	0.83	1.12	0.627	1.18	0.0605	0.171	17.58%	9.05%
34122-008; 008		8	0.731	0.607	0.854	0.551	1.04	0.0522	0.148	20.21%	31.72%
34122-009; 009		8	1.48	1.17	1.79	0.938	1.98	0.131	0.371	25.09%	-38.12%
34122-010; 010		8	0.672	0.622	0.722	0.603	0.765	0.0211	0.0596	8.87%	37.18%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.846	0.923	1.13	1.1	1.2	1.06	1.38	0.927
34122-001; 001	R1		0.8	0.456	0.853	0.837	0.792	1.04	0.451
34122-002; 002	R2		0.973	1.03	0.739	0.388	0.894	0.758	0.811
34122-003; 003	R3	0.908		0.907	1.14	0.649	0.797	1.85	0.494
34122-004; 004	R4	1	1.08	1.22	0.968	1.06	0.559	1.21	0.294
34122-005; 005	R5	0.926		0.872	1.07	1.05			0.743
34122-006; 006		0.881	0.873	0.871	0.642	0.731	0.362	1.12	0.515
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.627	0.929
34122-008; 008		0.748	1.04	0.688	0.551	0.647	0.829	0.708	0.64
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.938	1.98	1.65
34122-010; 010		0.616	0.673	0.716	0.727	0.662	0.603	0.765	0.615

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28-day Survival, Growth and Reproduction Sediment Evaluation
TASK: Statistical Analysis of Dry Weight Data

Station	Method	C (H_0)	>	T (H_1)	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Sed-321-C120-0-0.5; 34122-001	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-001; 001	3.225726	1.77093	0.00331547	0.05	TRUE	0.1776982	13		C
Sed-322-C120-0-0.5; 34122-002	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-002; 002	2.738215	1.77093	0.00845719	0.05	TRUE	0.1753267	13		C
Sed-323-C120-0-0.5; 34122-003	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-003; 003	2.402124	1.78229	0.01669454	0.05	TRUE	0.1887369	12		C
Sed-323-C120-0-0.5; 34122-003	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-003; 003	0.6325693	1.77093	0.2689914	0.05	FALSE	0.2984553	13		C
Sed-324-C120-0-0.5; 34122-004	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-004; 004	1.120067	1.76131	0.1407664	0.05	FALSE	0.2302825	14		C
Sed-325-C120-0-0.5; 34122-005	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-005; 005	1.519581	1.79589	0.07841206	0.05	FALSE	0.1635077	11		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-006; 006	3.077724	1.76131	0.00409333	0.05	TRUE	0.183591	14		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-007; 007	1.127023	1.76131	0.1393399	0.05	FALSE	0.1513414	14		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-008; 008	4.226346	1.76131	0.00042305	0.05	TRUE	0.1414508	14		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-009; 009	-2.820591	1.76131	0.9931915	0.05	FALSE	0.2547237	14		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-010; 010	6.160993	1.76131	1.2361E-05	0.05	TRUE	0.1137341	14		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-006; 006	-0.024218	1.77093	0.5094768	0.05	FALSE	0.2095943	13		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-007; 007	-2.269503	1.77093	0.979547	0.05	FALSE	0.1770029	13		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-008; 008	0.1667618	1.77093	0.4350617	0.05	FALSE	0.1671885	13		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-009; 009	-4.572106	1.77093	0.9997382	0.05	FALSE	0.2833711	13		C
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-001; 001	>	34122-010; 010	0.879463	1.94318	0.2064916	0.05	FALSE	0.1638637	6		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-006; 006	0.4241461	1.77093	0.3391969	0.05	FALSE	0.2075875	13		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-007; 007	-1.767161	1.77093	0.9496738	0.05	FALSE	0.174622	13		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-008; 008	0.7348471	1.77093	0.2377403	0.05	FALSE	0.1646657	13		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-009; 009	-4.265774	1.77093	0.9995401	0.05	FALSE	0.28189	13		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-010; 010	4.069425	1.78229	0.0007776	0.05	TRUE	0.0855219	12		C
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-002; 002	>	34122-010; 010	1.536736	1.94318	0.08763451	0.05	FALSE	0.1602702	6		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-006; 006	1.191087	1.77093	0.1274565	0.05	FALSE	0.3184787	13		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-006; 006	0.5275067	1.78229	0.3037287	0.05	FALSE	0.2244575	12		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-007; 007	-0.058034	1.77093	0.5226979	0.05	FALSE	0.2980419	13		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-007; 007	-1.493832	1.78229	0.9194793	0.05	FALSE	0.1879546	12		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-008; 008	0.8568544	1.78229	0.2041557	0.05	FALSE	0.1768921	12		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-008; 008	1.410416	1.77093	0.0909471	0.05	FALSE	0.2923199	13		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-009; 009	-2.454639	1.77093	0.9855203	0.05	FALSE	0.3712116	13		C

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28-day Survival, Growth and Reproduction Sediment Evaluation
TASK: Statistical Analysis of Dry Weight Data

Station	Method	C (H_0)	>	T (H_1)	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-003; 003	>	34122-010; 010	1.523388	2.01505	0.09408159	0.05	FALSE	0.1897636	5		C
Sed-339-C120-0-0.5; 34122-010	Wilcoxon Rank Sum Two-Sample Test	34122-003; 003	>	34122-010; 010	49		0.04693085	0.05	TRUE		13	0	E
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-006; 006	1.21758	1.76131	0.1217542	0.05	FALSE	0.2522302	14		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-007; 007	-0.380148	1.76131	0.6452296	0.05	FALSE	0.229823	14		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-008; 008	1.521202	1.76131	0.07523526	0.05	FALSE	0.2234339	14		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-009; 009	-3.171235	1.76131	0.9966007	0.05	FALSE	0.3078938	14		C
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-004; 004	>	34122-010; 010	2.139027	1.89458	0.03486722	0.05	TRUE	0.2226647	7		C
Sed-339-C120-0-0.5; 34122-010	Wilcoxon Rank Sum Two-Sample Test	34122-004; 004	>	34122-010; 010	44		0.01025641	0.05	TRUE		13	0	E
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-006; 006	1.545497	1.79589	0.07524706	0.05	FALSE	0.2120167	11		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-007; 007	-0.459073	1.79589	0.6724398	0.05	FALSE	0.1623917	11		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-008; 008	2.468969	1.79589	0.01558923	0.05	TRUE	0.1462522	11		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-009; 009	-3.124539	1.79589	0.9951643	0.05	FALSE	0.3139785	11		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-010; 010	4.852301	1.79589	0.00025445	0.05	TRUE	0.0960383	11		C

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	17-9446-4246	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:35	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-001; 001 failed mean dry weight-mg	16.61%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 1*	3.23	1.77	0.178	13	CDF	0.0033	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.66	2.55	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.391123	0.391123	1	10.4	0.0066	Significant Effect
Error	0.488654	0.0375888	13			
Total	0.879777		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.57	9.16	0.5688	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.939	0.833	0.3720	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.07	0.926	1.21		0.846	1.38	0.061	16.13%	0.00%
34122-001; 001	R1	7	0.746	0.547	0.946		0.451	1.04	0.0817	28.95%	30.25%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.846	0.923	1.13	1.1	1.2	1.06	1.38	0.927
34122-001; 001	R1	0.8	0.456	0.853	0.837	0.792	1.04	0.451	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-1288-3692	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:35	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-002; 002 failed mean dry weight-mg	16.39%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 2*	2.74	1.77	0.175	13	CDF	0.0085	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.23	2.55	0.2141	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.274362	0.274362	1	7.5	0.0169	Significant Effect
Error	0.475699	0.0365922	13			
Total	0.75006		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.49	9.16	0.6087	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.983	0.833	0.9865	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.07	0.926	1.21		0.846	1.38	0.061	16.13%	0.00%
34122-002; 002	R2	7	0.799	0.604	0.994		0.388	1.03	0.0797	26.41%	25.34%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.846	0.923	1.13	1.1	1.2	1.06	1.38	0.927
34122-002; 002	R2	0.973	1.03	0.739	0.388	0.894	0.758	0.811	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	21-2837-3249	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-003; 003 passed mean dry weight-mg	27.89%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 3	0.633	1.77	0.298	13	CDF	0.2690	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.83	2.55	0.0087	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0424294	0.0424294	1	0.4	0.5380	Non-Significant Effect
Error	1.37846	0.106035	13			
Total	1.42089		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	6.54	9.16	0.0260	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.885	0.833	0.0557	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.07	0.926	1.21		0.846	1.38	0.061	16.13%	0.00%
34122-003; 003	R3	7	0.963	0.555	1.37		0.494	1.85	0.167	45.83%	9.96%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.846	0.923	1.13	1.1	1.2	1.06	1.38	0.927
34122-003; 003	R3	0.908	0.907	1.14	0.649	0.797	1.85	0.494	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	19-1284-5805	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-003; 003 failed mean dry weight-mg	17.64%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 3*	2.4	1.78	0.189	12	CDF	0.0167	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.221851	0.221851	1	5.77	0.0334	Significant Effect
Error	0.461373	0.0384478	12			
Total	0.683224		13			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.7	9.52	0.5066	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.963	0.824	0.7728	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.07	0.926	1.21		0.846	1.38	0.061	16.13%	0.00%
34122-003; 003	R3	6	0.816	0.58	1.05		0.494	1.14	0.0918	27.57%	23.77%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.846	0.923	1.13	1.1	1.2	1.06	1.38	0.927
34122-003; 003	R3	0.908	0.907	1.14	0.649	0.797	Outlier	0.494	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	03-3516-5371	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-004; 004 passed mean dry weight-mg	21.52%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 4	1.12	1.76	0.23	14	CDF	0.1408	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.49	2.59	0.0797	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0857825	0.0857825	1	1.25	0.2815	Non-Significant Effect
Error	0.957279	0.068377	14			
Total	1.04306		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.59	8.89	0.1136	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.916	0.841	0.1441	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.07	0.926	1.21		0.846	1.38	0.061	16.13%	0.00%
34122-004; 004	R4	8	0.924	0.65	1.2		0.294	1.22	0.116	35.41%	13.69%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.846	0.923	1.13	1.1	1.2	1.06	1.38	0.927
34122-004; 004	R4	1	1.08	1.22	0.968	1.06	0.559	1.21	0.294

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-8135-8185	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-005; 005 passed mean dry weight-mg	15.28%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 5	1.52	1.8	0.164	11	CDF	0.0784	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.02	2.46	0.3570	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0588957	0.0588957	1	2.31	0.1568	Non-Significant Effect
Error	0.280562	0.0255056	11			
Total	0.339458		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.66	21.6	0.6544	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.966	0.814	0.8424	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.07	0.926	1.21		0.846	1.38	0.061	16.13%	0.00%
34122-005; 005	R5	5	0.932	0.765	1.1		0.743	1.07	0.06	14.39%	12.93%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.846	0.923	1.13	1.1	1.2	1.06	1.38	0.927
34122-005; 005	R5	0.926	0.872	1.07	1.05	0.743			

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	12-2610-5934	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 failed mean dry weight-mg	17.16%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-006; 006*	3.08	1.76	0.184	14	CDF	0.0041	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.92	2.59	0.6804	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.411671	0.411671	1	9.47	0.0082	Significant Effect
Error	0.608442	0.0434602	14			
Total	1.02011		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.92	8.89	0.4103	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.977	0.841	0.9301	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.07	0.926	1.21		0.846	1.38	0.061	16.13%	0.00%
34122-006; 006		8	0.749	0.549	0.949		0.362	1.12	0.0845	31.90%	29.98%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.846	0.923	1.13	1.1	1.2	1.06	1.38	0.927
34122-006; 006		0.881	0.873	0.871	0.642	0.731	0.362	1.12	0.515

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	10-0696-2817	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed mean dry weight-mg	14.14%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-007; 007	1.13	1.76	0.151	14	CDF	0.1393	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.09	2.59	0.4046	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0375119	0.0375119	1	1.27	0.2787	Non-Significant Effect
Error	0.413459	0.0295328	14			
Total	0.450971		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.02	8.89	0.9812	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.986	0.841	0.9947	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.07	0.926	1.21		0.846	1.38	0.061	16.13%	0.00%
34122-007; 007		8	0.973	0.83	1.12		0.627	1.18	0.0605	17.58%	9.05%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.846	0.923	1.13	1.1	1.2	1.06	1.38	0.927
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.627	0.929

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-8955-1759	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed mean dry weight-mg	13.22%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-008; 008*	4.23	1.76	0.141	14	CDF	4.2E-04	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.99	2.59	0.5439	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.460818	0.460818	1	17.9	8.5E-04	Significant Effect
Error	0.361183	0.0257988	14			
Total	0.822001		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.37	8.89	0.6899	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.937	0.841	0.3179	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.07	0.926	1.21		0.846	1.38	0.061	16.13%	0.00%
34122-008; 008		8	0.731	0.607	0.854		0.551	1.04	0.0522	20.21%	31.72%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.846	0.923	1.13	1.1	1.2	1.06	1.38	0.927
34122-008; 008		0.748	1.04	0.688	0.551	0.647	0.829	0.708	0.64

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-0092-1963	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed mean dry weight-mg	23.81%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-009; 009	-2.82	1.76	0.255	14	CDF	0.9932	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.93	2.59	0.6560	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.665591	0.665591	1	7.96	0.0136	Significant Effect
Error	1.17126	0.0836618	14			
Total	1.83686		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	4.61	8.89	0.0614	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.982	0.841	0.9796	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.07	0.926	1.21		0.846	1.38	0.061	16.13%	0.00%
34122-009; 009		8	1.48	1.17	1.79		0.938	1.98	0.131	25.09%	-38.12%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.846	0.923	1.13	1.1	1.2	1.06	1.38	0.927
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.938	1.98	1.65

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	17-4518-3112	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed mean dry weight-mg	10.63%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-010; 010*	6.16	1.76	0.114	14	CDF	1.2E-05	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.48	2.59	0.0843	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.633098	0.633098	1	38	2.5E-05	Significant Effect
Error	0.233506	0.016679	14			
Total	0.866604		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	8.39	8.89	0.0118	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.958	0.841	0.6341	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	1.07	0.926	1.21		0.846	1.38	0.061	16.13%	0.00%
34122-010; 010		8	0.672	0.622	0.722		0.603	0.765	0.0211	8.87%	37.18%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.846	0.923	1.13	1.1	1.2	1.06	1.38	0.927
34122-010; 010		0.616	0.673	0.716	0.727	0.662	0.603	0.765	0.615

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	20-2580-5867	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed mean dry weight-mg	28.08%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-006; 006	-0.0242	1.77	0.21	13	CDF	0.5095	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.76	2.55	0.9972	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.067E-05	3.067E-05	1	0.000587	0.9810	Non-Significant Effect
Error	0.679821	0.0522939	13			
Total	0.679852		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.22	10.8	0.8215	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.939	0.833	0.3719	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.746	0.547	0.946		0.451	1.04	0.0817	28.95%	0.00%
34122-006; 006		8	0.749	0.549	0.949		0.362	1.12	0.0845	31.90%	-0.38%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.8	0.456	0.853	0.837	0.792	1.04	0.451	
34122-006; 006		0.881	0.873	0.871	0.642	0.731	0.362	1.12	0.515

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	19-4857-6800	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed mean dry weight-mg	23.72%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-007; 007	-2.27	1.77	0.177	13	CDF	0.9795	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.86	2.55	0.7444	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.192094	0.192094	1	5.15	0.0409	Significant Effect
Error	0.484838	0.0372952	13			
Total	0.676932		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.59	9.16	0.5536	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.904	0.833	0.1103	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.746	0.547	0.946		0.451	1.04	0.0817	28.95%	0.00%
34122-007; 007		8	0.973	0.83	1.12		0.627	1.18	0.0605	17.58%	-30.39%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.8	0.456	0.853	0.837	0.792	1.04	0.451	
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.627	0.929

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	08-5913-8148	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 passed mean dry weight-mg	22.40%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-008; 008	0.167	1.77	0.167	13	CDF	0.4351	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.73	2.55	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0009253	0.0009253	1	0.0278	0.8701	Non-Significant Effect
Error	0.432562	0.033274	13			
Total	0.433487		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.14	9.16	0.3420	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.956	0.833	0.6150	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.746	0.547	0.946		0.451	1.04	0.0817	28.95%	0.00%
34122-008; 008		8	0.731	0.607	0.854		0.551	1.04	0.0522	20.21%	2.11%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.8	0.456	0.853	0.837	0.792	1.04	0.451	
34122-008; 008		0.748	1.04	0.688	0.551	0.647	0.829	0.708	0.64

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	05-8184-9564	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed mean dry weight-mg	37.97%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-009; 009	-4.57	1.77	0.283	13	CDF	0.9997	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.81	2.55	0.8521	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.99819	1.99819	1	20.9	5.2E-04	Significant Effect
Error	1.24264	0.095588	13			
Total	3.24083		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.95	10.8	0.2091	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.959	0.833	0.6695	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.746	0.547	0.946		0.451	1.04	0.0817	28.95%	0.00%
34122-009; 009		8	1.48	1.17	1.79		0.938	1.98	0.131	25.09%	-98.03%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.8	0.456	0.853	0.837	0.792	1.04	0.451	
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.938	1.98	1.65

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	05-3541-8214	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 passed mean dry weight-mg	21.96%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-010; 010	0.879	1.94	0.164	6	CDF	0.2065	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2	2.55	0.4797	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0205339	0.0205339	1	0.876	0.3665	Non-Significant Effect
Error	0.304885	0.0234527	13			
Total	0.325419		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	13.1	9.16	0.0034	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.899	0.833	0.0907	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.746	0.547	0.946		0.451	1.04	0.0817	28.95%	0.00%
34122-010; 010		8	0.672	0.622	0.722		0.603	0.765	0.0211	8.87%	9.94%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.8	0.456	0.853	0.837	0.792	1.04	0.451	
34122-010; 010		0.616	0.673	0.716	0.727	0.662	0.603	0.765	0.615

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	07-1404-3662	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed mean dry weight-mg	25.98%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-006; 006	0.424	1.77	0.208	13	CDF	0.3392	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.88	2.55	0.6956	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0092284	0.0092284	1	0.18	0.6784	Non-Significant Effect
Error	0.666865	0.0512973	13			
Total	0.676094		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.28	10.8	0.7771	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.952	0.833	0.5521	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	0.799	0.604	0.994		0.388	1.03	0.0797	26.41%	0.00%
34122-006; 006		8	0.749	0.549	0.949		0.362	1.12	0.0845	31.90%	6.22%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.973	1.03	0.739	0.388	0.894	0.758	0.811	
34122-006; 006		0.881	0.873	0.871	0.642	0.731	0.362	1.12	0.515

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	16-6439-6006	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed mean dry weight-mg	21.86%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-007; 007	-1.77	1.77	0.175	13	CDF	0.9497	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.24	2.55	0.2067	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.113355	0.113355	1	3.12	0.1007	Non-Significant Effect
Error	0.471882	0.0362986	13			
Total	0.585237		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.52	9.16	0.5930	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.896	0.833	0.0830	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	0.799	0.604	0.994		0.388	1.03	0.0797	26.41%	0.00%
34122-007; 007		8	0.973	0.83	1.12		0.627	1.18	0.0605	17.58%	-21.81%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.973	1.03	0.739	0.388	0.894	0.758	0.811	
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.627	0.929

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	16-5821-5843	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 passed mean dry weight-mg	20.61%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-008; 008	0.735	1.77	0.165	13	CDF	0.2377	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.37	2.55	0.1169	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0174298	0.0174298	1	0.54	0.4755	Non-Significant Effect
Error	0.419606	0.0322774	13			
Total	0.437036		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.04	9.16	0.3718	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.955	0.833	0.6052	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	0.799	0.604	0.994		0.388	1.03	0.0797	26.41%	0.00%
34122-008; 008		8	0.731	0.607	0.854		0.551	1.04	0.0522	20.21%	8.55%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.973	1.03	0.739	0.388	0.894	0.758	0.811	
34122-008; 008		0.748	1.04	0.688	0.551	0.647	0.829	0.708	0.64

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	17-9650-2620	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed mean dry weight-mg	35.28%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-009; 009	-4.27	1.77	0.282	13	CDF	0.9995	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.82	2.55	0.8296	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.72126	1.72126	1	18.2	9.2E-04	Significant Effect
Error	1.22969	0.0945914	13			
Total	2.95095		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.09	10.8	0.1905	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.97	0.833	0.8637	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	0.799	0.604	0.994		0.388	1.03	0.0797	26.41%	0.00%
34122-009; 009		8	1.48	1.17	1.79		0.938	1.98	0.131	25.09%	-84.99%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.973	1.03	0.739	0.388	0.894	0.758	0.811	
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.938	1.98	1.65

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	10-8605-9306	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 passed mean dry weight-mg	20.06%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-010; 010	1.54	1.94	0.16	6	CDF	0.0876	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.85	2.55	0.0073	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0599756	0.0599756	1	2.67	0.1262	Non-Significant Effect
Error	0.291929	0.0224561	13			
Total	0.351905		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	12.5	9.16	0.0039	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.861	0.833	0.0248	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	0.799	0.604	0.994		0.388	1.03	0.0797	26.41%	0.00%
34122-010; 010		8	0.672	0.622	0.722		0.603	0.765	0.0211	8.87%	15.87%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.973	1.03	0.739	0.388	0.894	0.758	0.811	
34122-010; 010		0.616	0.673	0.716	0.727	0.662	0.603	0.765	0.615

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	08-7054-2640	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed mean dry weight-mg	9.86%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-010; 010*	4.07	1.78	0.086	12	CDF	7.8E-04	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.130731	0.130731	1	16.6	0.0016	Significant Effect
Error	0.0947314	0.0078943	12			
Total	0.225462		13			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.93	9.52	0.1023	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.967	0.824	0.8368	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	6	0.867	0.743	0.991		0.739	1.03	0.0483	13.63%	0.00%
34122-010; 010		8	0.672	0.622	0.722		0.603	0.765	0.0211	8.87%	22.51%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.973	1.03	0.739	Outlier	0.894	0.758	0.811	
34122-010; 010		0.616	0.673	0.716	0.727	0.662	0.603	0.765	0.615

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	14-7615-0285	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed mean dry weight-mg	33.06%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-006; 006	1.19	1.77	0.318	13	CDF	0.1275	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.65	2.55	0.0285	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.171293	0.171293	1	1.42	0.2549	Non-Significant Effect
Error	1.56963	0.120741	13			
Total	1.74092		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.41	9.16	0.1332	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.918	0.833	0.1770	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.963	0.555	1.37		0.494	1.85	0.167	45.83%	0.00%
34122-006; 006		8	0.749	0.549	0.949		0.362	1.12	0.0845	31.90%	22.23%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.908	0.907	1.14	0.649	0.797	1.85	0.494	
34122-006; 006		0.881	0.873	0.871	0.642	0.731	0.362	1.12	0.515

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	14-0662-8202	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed mean dry weight-mg	30.94%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-007; 007	-0.058	1.77	0.298	13	CDF	0.5227	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.83	2.55	0.0084	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0003561	0.0003561	1	0.00337	0.9546	Non-Significant Effect
Error	1.37464	0.105742	13			
Total	1.375		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	6.66	9.16	0.0247	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.876	0.833	0.0417	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.963	0.555	1.37		0.494	1.85	0.167	45.83%	0.00%
34122-007; 007		8	0.973	0.83	1.12		0.627	1.18	0.0605	17.58%	-1.01%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.908	0.907	1.14	0.649	0.797	1.85	0.494	
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.627	0.929

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	19-4915-4491	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 passed mean dry weight-mg	30.34%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-008; 008	1.41	1.77	0.292	13	CDF	0.0909	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.88	2.55	0.0054	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.20235	0.20235	1	1.99	0.1819	Non-Significant Effect
Error	1.32237	0.101721	13			
Total	1.52472		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	8.95	9.16	0.0107	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.852	0.833	0.0187	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.963	0.555	1.37		0.494	1.85	0.167	45.83%	0.00%
34122-008; 008		8	0.731	0.607	0.854		0.551	1.04	0.0522	20.21%	24.17%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.908	0.907	1.14	0.649	0.797	1.85	0.494	
34122-008; 008		0.748	1.04	0.688	0.551	0.647	0.829	0.708	0.64

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	09-3336-5311	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed mean dry weight-mg	38.53%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-009; 009	-2.45	1.77	0.371	13	CDF	0.9855	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.27	2.55	0.1815	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.98835	0.98835	1	6.03	0.0290	Significant Effect
Error	2.13245	0.164035	13			
Total	3.1208		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.42	9.16	0.6539	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.95	0.833	0.5211	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.963	0.555	1.37		0.494	1.85	0.167	45.83%	0.00%
34122-009; 009		8	1.48	1.17	1.79		0.938	1.98	0.131	25.09%	-53.41%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.908	0.907	1.14	0.649	0.797	1.85	0.494	
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.938	1.98	1.65

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	18-8579-2717	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed mean dry weight-mg	28.84%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-010; 010*	49	n/a	0	13	Exact	0.0469	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	3.04	2.55	0.0014	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.316643	0.316643	1	3.45	0.0862	Non-Significant Effect
Error	1.19469	0.0918993	13			
Total	1.51133		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	54.9	9.16	3.1E-05	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.786	0.833	0.0024	Non-Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.963	0.555	1.37		0.494	1.85	0.167	45.83%	0.00%
34122-010; 010		8	0.672	0.622	0.722		0.603	0.765	0.0211	8.87%	30.23%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.908	0.907	1.14	0.649	0.797	1.85	0.494	
34122-010; 010		0.616	0.673	0.716	0.727	0.662	0.603	0.765	0.615

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	16-7027-5572	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 passed mean dry weight-mg	23.27%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-010; 010	1.52	2.02	0.19	5	CDF	0.0941	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0705649	0.0705649	1	3.05	0.1062	Non-Significant Effect
Error	0.277604	0.0231336	12			
Total	0.348169		13			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	14.2	9.52	0.0030	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.935	0.824	0.3634	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	6	0.816	0.58	1.05		0.494	1.14	0.0918	27.57%	0.00%
34122-010; 010		8	0.672	0.622	0.722		0.603	0.765	0.0211	8.87%	17.59%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.908	0.907	1.14	0.649	0.797	Outlier	0.494	
34122-010; 010		0.616	0.673	0.716	0.727	0.662	0.603	0.765	0.615

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-5552-0648	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed mean dry weight-mg	27.31%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-006; 006	1.22	1.76	0.252	14	CDF	0.1218	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.28	2.59	0.2032	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.121612	0.121612	1	1.48	0.2435	Non-Significant Effect
Error	1.14845	0.0820318	14			
Total	1.27006		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.87	8.89	0.4268	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.913	0.841	0.1323	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.924	0.65	1.2		0.294	1.22	0.116	35.41%	0.00%
34122-006; 006		8	0.749	0.549	0.949		0.362	1.12	0.0845	31.90%	18.88%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1	1.08	1.22	0.968	1.06	0.559	1.21	0.294
34122-006; 006		0.881	0.873	0.871	0.642	0.731	0.362	1.12	0.515

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	20-4850-5684	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed mean dry weight-mg	24.88%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-007; 007	-0.38	1.76	0.23	14	CDF	0.6452	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.5	2.59	0.0778	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0098419	0.0098419	1	0.145	0.7095	Non-Significant Effect
Error	0.953462	0.0681044	14			
Total	0.963304		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.66	8.89	0.1088	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.872	0.841	0.0294	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.924	0.65	1.2		0.294	1.22	0.116	35.41%	0.00%
34122-007; 007		8	0.973	0.83	1.12		0.627	1.18	0.0605	17.58%	-5.37%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1	1.08	1.22	0.968	1.06	0.559	1.21	0.294
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.627	0.929

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	19-3135-8976	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 passed mean dry weight-mg	24.19%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-008; 008	1.52	1.76	0.223	14	CDF	0.0752	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.57	2.59	0.0547	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.148957	0.148957	1	2.31	0.1505	Non-Significant Effect
Error	0.901186	0.0643704	14			
Total	1.05014		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	4.91	8.89	0.0523	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.912	0.841	0.1276	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.924	0.65	1.2		0.294	1.22	0.116	35.41%	0.00%
34122-008; 008		8	0.731	0.607	0.854		0.551	1.04	0.0522	20.21%	20.89%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1	1.08	1.22	0.968	1.06	0.559	1.21	0.294
34122-008; 008		0.748	1.04	0.688	0.551	0.647	0.829	0.708	0.64

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	12-4410-8576	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed mean dry weight-mg	33.34%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-009; 009	-3.17	1.76	0.308	14	CDF	0.9966	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.86	2.59	0.8023	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.22927	1.22927	1	10.1	0.0068	Significant Effect
Error	1.71127	0.122233	14			
Total	2.94054		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.29	8.89	0.7486	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.947	0.841	0.4511	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.924	0.65	1.2		0.294	1.22	0.116	35.41%	0.00%
34122-009; 009		8	1.48	1.17	1.79		0.938	1.98	0.131	25.09%	-60.02%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1	1.08	1.22	0.968	1.06	0.559	1.21	0.294
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.938	1.98	1.65

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-6807-6144	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed mean dry weight-mg	24.11%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-010; 010*	2.14	1.89	0.223	7	CDF	0.0349	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.77	2.59	0.0171	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.252796	0.252796	1	4.58	0.0505	Non-Significant Effect
Error	0.773509	0.0552506	14			
Total	1.0263		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	30.1	8.89	2.1E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.847	0.841	0.0122	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.924	0.65	1.2		0.294	1.22	0.116	35.41%	0.00%
34122-010; 010		8	0.672	0.622	0.722		0.603	0.765	0.0211	8.87%	27.22%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1	1.08	1.22	0.968	1.06	0.559	1.21	0.294
34122-010; 010		0.616	0.673	0.716	0.727	0.662	0.603	0.765	0.615

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-3100-9806	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed mean dry weight-mg	22.76%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-006; 006	1.55	1.8	0.212	11	CDF	0.0752	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.95	2.46	0.4581	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.102432	0.102432	1	2.39	0.1505	Non-Significant Effect
Error	0.471729	0.0428844	11			
Total	0.574161		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.18	21.6	0.2809	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.961	0.814	0.7667	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	0.932	0.765	1.1		0.743	1.07	0.06	14.39%	0.00%
34122-006; 006		8	0.749	0.549	0.949		0.362	1.12	0.0845	31.90%	19.58%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.926	0.872	1.07	1.05	0.743			
34122-006; 006		0.881	0.873	0.871	0.642	0.731	0.362	1.12	0.515

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	06-5028-4005	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed mean dry weight-mg	17.43%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-007; 007	-0.459	1.8	0.162	11	CDF	0.6724	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.28	2.46	0.1270	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0053021	0.0053021	1	0.211	0.6551	Non-Significant Effect
Error	0.276745	0.0251587	11			
Total	0.282047		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.63	21.6	0.6680	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.932	0.814	0.3657	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	0.932	0.765	1.1		0.743	1.07	0.06	14.39%	0.00%
34122-007; 007		8	0.973	0.83	1.12		0.627	1.18	0.0605	17.58%	-4.46%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.926	0.872	1.07	1.05	0.743			
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.627	0.929

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	21-0179-7293	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed mean dry weight-mg	15.70%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-008; 008*	2.47	1.8	0.146	11	CDF	0.0156	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.23	2.46	0.1618	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.124393	0.124393	1	6.1	0.0312	Significant Effect
Error	0.224469	0.0204063	11			
Total	0.348862		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.21	21.6	0.9022	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.949	0.814	0.5841	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	0.932	0.765	1.1		0.743	1.07	0.06	14.39%	0.00%
34122-008; 008		8	0.731	0.607	0.854		0.551	1.04	0.0522	20.21%	21.58%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.926	0.872	1.07	1.05	0.743			
34122-008; 008		0.748	1.04	0.688	0.551	0.647	0.829	0.708	0.64

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	04-5613-3394	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed mean dry weight-mg	33.70%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-009; 009	-3.12	1.8	0.314	11	CDF	0.9952	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.84	2.46	0.6514	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.918188	0.918188	1	9.76	0.0097	Significant Effect
Error	1.03455	0.0940501	11			
Total	1.95274		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.65	21.6	0.0676	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.976	0.814	0.9542	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	0.932	0.765	1.1		0.743	1.07	0.06	14.39%	0.00%
34122-009; 009		8	1.48	1.17	1.79		0.938	1.98	0.131	25.09%	-58.63%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.926	0.872	1.07	1.05	0.743			
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.938	1.98	1.65

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	03-4639-0704	**Endpoint:**	Mean Dry Weight-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed mean dry weight-mg	10.31%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-010; 010*	4.85	1.8	0.096	11	CDF	2.5E-04	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.1	2.46	0.2686	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.207178	0.207178	1	23.5	5.1E-04	Significant Effect
Error	0.0967924	0.0087993	11			
Total	0.303971		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.06	10.1	0.0619	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.96	0.814	0.7523	Normal Distribution

Mean Dry Weight-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	0.932	0.765	1.1		0.743	1.07	0.06	14.39%	0.00%
34122-010; 010		8	0.672	0.622	0.722		0.603	0.765	0.0211	8.87%	27.85%

Mean Dry Weight-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.926	0.872	1.07	1.05	0.743			
34122-010; 010		0.616	0.673	0.716	0.727	0.662	0.603	0.765	0.615

28 day *Leptocheirus plumulosus* Survival, Growth and Reproduction Sediment Evaluation

CETIS™ Summary, Ad Hoc Query and Analytical Reports

Dry Biomass Statistical Analysis

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test **Enthalpy Analytical, LLC**

Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h		
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d		
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d		
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d		
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h		
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
03-7028-1905	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.0163	34122-001; 001 failed mean dry biomass-	1
02-1625-1386	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.0242	34122-002; 002 failed mean dry biomass-	1
08-1620-0504	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.0424	34122-003; 003 failed mean dry biomass-	1
05-5070-4116	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.4196	34122-004; 004 passed mean dry biomass	1
14-6847-4174	Mean Dry Biomass-mg	Wilcoxon Rank Sum Two-Sample Test	0.2527	34122-004; 004 passed mean dry biomass	1
02-8474-4004	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.1341	34122-005; 005 passed mean dry biomass	1
03-2948-5931	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.0152	34122-006; 006 failed mean dry biomass-	1
07-7884-1377	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.1761	34122-006; 006 passed mean dry biomass	1
07-9603-7153	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.7000	34122-006; 006 passed mean dry biomass	1
09-7323-3324	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.0182	34122-006; 006 failed mean dry biomass-	1
10-3941-4169	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.4700	34122-006; 006 passed mean dry biomass	1
12-8192-9551	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.1200	34122-006; 006 passed mean dry biomass	1
15-5498-3288	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.5042	34122-006; 006 passed mean dry biomass	1
00-5218-9790	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.9345	34122-007; 007 passed mean dry biomass	1
01-1039-1090	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.3951	34122-007; 007 passed mean dry biomass	1
04-3459-2035	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.9591	34122-007; 007 passed mean dry biomass	1
07-1878-3310	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.9741	34122-007; 007 passed mean dry biomass	1
19-0120-4869	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.9826	34122-007; 007 passed mean dry biomass	1
21-1669-9014	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.7945	34122-007; 007 passed mean dry biomass	1
11-5193-1301	Mean Dry Biomass-mg	Wilcoxon Rank Sum Two-Sample Test	0.4775	34122-007; 007 passed mean dry biomass	1
13-6746-6569	Mean Dry Biomass-mg	Wilcoxon Rank Sum Two-Sample Test	0.6395	34122-007; 007 passed mean dry biomass	1
02-1485-8859	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.0068	34122-008; 008 failed mean dry biomass-	1
02-9290-7374	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	7.0E-05	34122-008; 008 failed mean dry biomass-	1
07-6161-8461	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.0237	34122-008; 008 failed mean dry biomass-	1

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test **Enthalpy Analytical, LLC**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
08-7203-6801	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	6.7E-04	34122-008; 008 failed mean dry biomass-	1
15-1243-4636	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.0330	34122-008; 008 failed mean dry biomass-	1
21-0995-7986	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.1184	34122-008; 008 passed mean dry biomass	1
21-4681-4240	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	5.7E-05	34122-008; 008 failed mean dry biomass-	1
00-1431-6206	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.9974	34122-009; 009 passed mean dry biomass	1
00-3677-6530	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.9994	34122-009; 009 passed mean dry biomass	1
02-0432-4960	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.9957	34122-009; 009 passed mean dry biomass	1
08-9990-5717	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.9997	34122-009; 009 passed mean dry biomass	1
17-0702-8260	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.9979	34122-009; 009 passed mean dry biomass	1
18-3265-5825	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.9997	34122-009; 009 passed mean dry biomass	1
01-9720-1267	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.0092	34122-010; 010 failed mean dry biomass-	1
08-4854-3786	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	3.1E-06	34122-010; 010 failed mean dry biomass-	1
12-6412-6382	Mean Dry Biomass-mg	Equal Variance t Two-Sample Test	0.0018	34122-010; 010 failed mean dry biomass-	1
10-6406-0453	Mean Dry Biomass-mg	Unequal Variance t Two-Sample Test	0.0018	34122-010; 010 failed mean dry biomass-	1
11-1491-4422	Mean Dry Biomass-mg	Unequal Variance t Two-Sample Test	0.2623	34122-010; 010 passed mean dry biomass	1
14-5319-8751	Mean Dry Biomass-mg	Unequal Variance t Two-Sample Test	0.5263	34122-010; 010 passed mean dry biomass	1
19-3579-4152	Mean Dry Biomass-mg	Unequal Variance t Two-Sample Test	0.2660	34122-010; 010 passed mean dry biomass	1
11-8791-5579	Mean Dry Biomass-mg	Wilcoxon Rank Sum Two-Sample Test	0.0415	34122-010; 010 failed mean dry biomass-	1
20-8455-8365	Mean Dry Biomass-mg	Wilcoxon Rank Sum Two-Sample Test	0.0070	34122-010; 010 failed mean dry biomass-	1

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
34122-000; 000	LC	8	0.972	0.78	1.16	0.507	1.24	0.0809	0.229	23.55%	0.00%
34122-001; 001	R1	7	0.617	0.3	0.933	0.04	1.04	0.129	0.342	55.47%	36.52%
34122-002; 002	R2	7	0.695	0.452	0.939	0.175	1.03	0.0995	0.263	37.86%	28.46%
34122-003; 003	R3	7	0.707	0.413	1	0.185	1.14	0.12	0.318	45.01%	27.20%
34122-004; 004	R4	8	0.84	0.544	1.14	0.0735	1.1	0.125	0.354	42.13%	13.58%
34122-005; 005	R5	5	0.838	0.667	1.01	0.632	1.02	0.0618	0.138	16.49%	13.73%
34122-006; 006		8	0.696	0.506	0.887	0.308	1.01	0.0807	0.228	32.78%	28.32%
34122-007; 007		8	0.94	0.74	1.14	0.407	1.18	0.0848	0.24	25.51%	3.27%
34122-008; 008		8	0.447	0.302	0.591	0.275	0.725	0.0612	0.173	38.71%	54.02%
34122-009; 009		8	1.41	1.13	1.68	0.844	1.93	0.117	0.331	23.57%	-44.74%
34122-010; 010		8	0.626	0.566	0.685	0.543	0.765	0.0252	0.0712	11.37%	35.59%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.507	0.877	1.07	1.05	1.14	1.06	1.24	0.835
34122-001; 001	R1		0.04	0.456	0.853	0.837	0.712	1.04	0.383
34122-002; 002	R2		0.779	1.03	0.703	0.175	0.805	0.606	0.77
34122-003; 003	R3	0.863		0.907	1.14	0.617	0.797	0.185	0.444
34122-004; 004	R4	0.903	1.03	1.1	0.968	1	0.559	1.09	0.0735
34122-005; 005	R5	0.833		0.872	1.02	0.837			0.632
34122-006; 006		0.881	0.829	0.783	0.642	0.658	0.308	1.01	0.463
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.407	0.883
34122-008; 008		0.636	0.725	0.275	0.331	0.55	0.456	0.283	0.32
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.844	1.58	1.57
34122-010; 010		0.616	0.673	0.609	0.654	0.562	0.543	0.765	0.585

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28-day Survival, Growth and Reproduction Sediment Evaluation
TASK: Statistical Analysis of Dry Biomass Data

Station	Method	C (H_0)	>	T (H_1)	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Sed-321-C120-0-0.5; 34122-001	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-001; 001	2.391684	1.77093	0.01629409	0.05	TRUE	0.2627888	13		C
Sed-322-C120-0-0.5; 34122-002	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-002; 002	2.178667	1.77093	0.02417658	0.05	TRUE	0.2247898	13		C
Sed-323-C120-0-0.5; 34122-003	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-003; 003	1.865298	1.77093	0.04243268	0.05	TRUE	0.2509581	13		C
Sed-324-C120-0-0.5; 34122-004	Wilcoxon Rank Sum Two-Sample Test	34122-000; 000	>	34122-004; 004	61		0.2526807	0.05	FALSE		14	0	E
Sed-324-C120-0-0.5; 34122-004	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-004; 004	0.2071145	1.77093	0.4195647	0.05	FALSE	0.1921603	13		C
Sed-325-C120-0-0.5; 34122-005	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-005; 005	1.166065	1.79589	0.1341242	0.05	FALSE	0.2054335	11		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-006; 006	2.408075	1.76131	0.0151975	0.05	TRUE	0.2012773	14		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-007; 007	0.2711328	1.76131	0.3951228	0.05	FALSE	0.2063679	14		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-008; 008	5.175816	1.76131	7.0338E-05	0.05	TRUE	0.1786129	14		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-009; 009	-3.052523	1.76131	0.9956967	0.05	FALSE	0.2508152	14		C
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-000; 000	>	34122-010; 010	4.082046	1.85955	0.00176208	0.05	TRUE	0.1575421	8		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-010; 010	7.27674	1.77093	3.1071E-06	0.05	TRUE	0.1003036	13		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-006; 006	-0.5376097	1.77093	0.7000355	0.05	FALSE	0.2625858	13		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-007; 007	-2.142009	1.77093	0.9741475	0.05	FALSE	0.2671553	13		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-008; 008	1.240211	1.77093	0.1184081	0.05	FALSE	0.2427094	13		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-009; 009	-4.534911	1.77093	0.9997198	0.05	FALSE	0.3083435	13		C
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-001; 001	>	34122-010; 010	-0.0688426	1.94318	0.5263241	0.05	FALSE	0.2559714	6		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-006; 006	-0.0107021	1.77093	0.5041882	0.05	FALSE	0.2245525	13		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-007; 007	-1.885701	1.77093	0.959061	0.05	FALSE	0.2298792	13		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-008; 008	2.1885	1.77093	0.02374468	0.05	TRUE	0.2009487	13		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-009; 009	-4.552459	1.77093	0.9997286	0.05	FALSE	0.2766735	13		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-010; 010	2.7275	1.78229	0.00917562	0.05	TRUE	0.1019792	12		C
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-002; 002	>	34122-010; 010	0.6753626	1.94318	0.2623022	0.05	FALSE	0.1993604	6		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-006; 006	0.07668088	1.77093	0.4700225	0.05	FALSE	0.2507456	13		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-007; 007	-1.611779	1.77093	0.9344941	0.05	FALSE	0.2555269	13		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-008; 008	2.007447	1.77093	0.0329772	0.05	TRUE	0.2298476	13		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-009; 009	-4.14955	1.77093	0.9994289	0.05	FALSE	0.2983249	13		C
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-003; 003	>	34122-010; 010	0.6629805	1.94318	0.2659858	0.05	FALSE	0.2388833	6		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-006; 006	2.332363	1.77093	0.01820122	0.05	TRUE	0.1918826	13		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-006; 006	0.9623615	1.76131	0.1760983	0.05	FALSE	0.2621754	14		C

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28-day Survival, Growth and Reproduction Sediment Evaluation
TASK: Statistical Analysis of Dry Biomass Data

Station	Method	C (H_0)	>	T (H_1)	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Sed-333-C120-0-0.5; 34122-007	Wilcoxon Rank Sum Two-Sample Test	34122-004; 004	>	34122-007; 007	63		0.4775447	0.05	FALSE		13	0	E
Sed-333-C120-0-0.5; 34122-007	Wilcoxon Rank Sum Two-Sample Test	34122-004; 004	>	34122-007; 007	71		0.6395493	0.05	FALSE		14	0	E
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-008; 008	2.822461	1.76131	0.00678339	0.05	TRUE	0.2452059	14		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-008; 008	5.437314	1.77093	5.6829E-05	0.05	TRUE	0.1636322	13		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-009; 009	-3.305956	1.76131	0.9973999	0.05	FALSE	0.3018802	14		C
Sed-339-C120-0-0.5; 34122-010	Wilcoxon Rank Sum Two-Sample Test	34122-004; 004	>	34122-010; 010	51		0.04149184	0.05	TRUE		14	0	E
Sed-339-C120-0-0.5; 34122-010	Wilcoxon Rank Sum Two-Sample Test	34122-004; 004	>	34122-010; 010	43		0.00699301	0.05	TRUE		13	0	E
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-006; 006	1.241922	1.79589	0.1200464	0.05	FALSE	0.2050504	11		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-007; 007	-2.439451	1.81246	0.9825591	0.05	FALSE	0.1320123	10		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-007; 007	-0.8544798	1.79589	0.7944687	0.05	FALSE	0.2135772	11		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-008; 008	4.260201	1.79589	0.00067128	0.05	TRUE	0.1650312	11		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-009; 009	-3.594172	1.79589	0.9978936	0.05	FALSE	0.2838477	11		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-010; 010	3.695334	1.79589	0.0017651	0.05	TRUE	0.103246	11		C

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	03-7028-1905	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:35	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-001; 001 failed mean dry biomass-mg	27.04%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 1*	2.39	1.77	0.263	13	CDF	0.0163	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.09	2.55	0.3624	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.470234	0.470234	1	5.72	0.0326	Significant Effect
Error	1.06868	0.0822065	13			
Total	1.53892		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.24	9.16	0.3165	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.942	0.833	0.4095	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.972	0.78	1.16	1.05	0.507	1.24	0.0809	23.55%	0.00%
34122-001; 001	R1	7	0.617	0.3	0.933	0.712	0.04	1.04	0.129	55.47%	36.52%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.507	0.877	1.07	1.05	1.14	1.06	1.24	0.835
34122-001; 001	R1	0.04	0.456	0.853	0.837	0.712	1.04	0.383	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	02-1625-1386	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:35	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-002; 002 failed mean dry biomass-mg	23.13%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 2*	2.18	1.77	0.225	13	CDF	0.0242	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.2	2.55	0.2381	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.285514	0.285514	1	4.75	0.0484	Significant Effect
Error	0.781968	0.0601514	13			
Total	1.06748		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.32	9.16	0.7164	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.881	0.833	0.0491	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.972	0.78	1.16	1.05	0.507	1.24	0.0809	23.55%	0.00%
34122-002; 002	R2	7	0.695	0.452	0.939	0.77	0.175	1.03	0.0995	37.86%	28.46%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.507	0.877	1.07	1.05	1.14	1.06	1.24	0.835
34122-002; 002	R2	0.779	1.03	0.703	0.175	0.805	0.606	0.77	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	08-1620-0504	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-003; 003 failed mean dry biomass-mg	25.83%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 3*	1.87	1.77	0.251	13	CDF	0.0424	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.98	2.55	0.5185	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.26085	0.26085	1	3.48	0.0849	Non-Significant Effect
Error	0.974626	0.0749713	13			
Total	1.23548		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.94	9.16	0.4075	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.94	0.833	0.3869	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.972	0.78	1.16	1.05	0.507	1.24	0.0809	23.55%	0.00%
34122-003; 003	R3	7	0.707	0.413	1	0.797	0.185	1.14	0.12	45.01%	27.20%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.507	0.877	1.07	1.05	1.14	1.06	1.24	0.835
34122-003; 003	R3	0.863	0.907	1.14	0.617	0.797	0.185	0.444	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	14-6847-4174	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-004; 004 passed mean dry biomass-mg	27.00%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 4	61	n/a	0	14	Exact	0.2527	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.66	2.59	0.0330	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0696303	0.0696303	1	0.785	0.3907	Non-Significant Effect
Error	1.24245	0.0887461	14			
Total	1.31208		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.39	8.89	0.2730	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.819	0.841	0.0049	Non-Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.972	0.78	1.16	1.05	0.507	1.24	0.0809	23.55%	0.00%
34122-004; 004	R4	8	0.84	0.544	1.14	0.985	0.0735	1.1	0.125	42.13%	13.58%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.507	0.877	1.07	1.05	1.14	1.06	1.24	0.835
34122-004; 004	R4	0.903	1.03	1.1	0.968	1	0.559	1.09	0.0735

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	02-8474-4004	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-005; 005 passed mean dry biomass-mg	21.14%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 5	1.17	1.8	0.205	11	CDF	0.1341	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.42	2.46	0.0645	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0547454	0.0547454	1	1.36	0.2682	Non-Significant Effect
Error	0.442889	0.0402626	11			
Total	0.497634		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.74	21.6	0.3467	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.932	0.814	0.3606	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.972	0.78	1.16	1.05	0.507	1.24	0.0809	23.55%	0.00%
34122-005; 005	R5	5	0.838	0.667	1.01	0.837	0.632	1.02	0.0618	16.49%	13.73%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.507	0.877	1.07	1.05	1.14	1.06	1.24	0.835
34122-005; 005	R5	0.833	0.872	1.02	0.837	0.632			

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	03-2948-5931	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 failed mean dry biomass-mg	20.71%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-006; 006*	2.41	1.76	0.201	14	CDF	0.0152	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.1	2.59	0.3822	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.302913	0.302913	1	5.8	0.0304	Significant Effect
Error	0.731318	0.052237	14			
Total	1.03423		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1	8.89	0.9954	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.938	0.841	0.3206	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.972	0.78	1.16	1.05	0.507	1.24	0.0809	23.55%	0.00%
34122-006; 006		8	0.696	0.506	0.887	0.721	0.308	1.01	0.0807	32.78%	28.32%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.507	0.877	1.07	1.05	1.14	1.06	1.24	0.835
34122-006; 006		0.881	0.829	0.783	0.642	0.658	0.308	1.01	0.463

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	01-1039-1090	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed mean dry biomass-mg	21.24%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-007; 007	0.271	1.76	0.206	14	CDF	0.3951	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.35	2.59	0.1490	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0040368	0.0040368	1	0.0735	0.7902	Non-Significant Effect
Error	0.768777	0.0549126	14			
Total	0.772814		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.1	8.89	0.9053	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.856	0.841	0.0166	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.972	0.78	1.16	1.05	0.507	1.24	0.0809	23.55%	0.00%
34122-007; 007		8	0.94	0.74	1.14	1.02	0.407	1.18	0.0848	25.51%	3.27%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.507	0.877	1.07	1.05	1.14	1.06	1.24	0.835
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.407	0.883

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	02-9290-7374	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed mean dry biomass-mg	18.38%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-008; 008*	5.18	1.76	0.179	14	CDF	7.0E-05	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.37	2.59	0.1386	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.10197	1.10197	1	26.8	1.4E-04	Significant Effect
Error	0.575893	0.0411352	14			
Total	1.67787		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.75	8.89	0.4777	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.938	0.841	0.3278	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.972	0.78	1.16	1.05	0.507	1.24	0.0809	23.55%	0.00%
34122-008; 008		8	0.447	0.302	0.591	0.393	0.275	0.725	0.0612	38.71%	54.02%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.507	0.877	1.07	1.05	1.14	1.06	1.24	0.835
34122-008; 008		0.636	0.725	0.275	0.331	0.55	0.456	0.283	0.32

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	02-0432-4960	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed mean dry biomass-mg	25.81%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-009; 009	-3.05	1.76	0.251	14	CDF	0.9957	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.04	2.59	0.4641	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.755813	0.755813	1	9.32	0.0086	Significant Effect
Error	1.1356	0.0811141	14			
Total	1.89141		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.1	8.89	0.3492	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.951	0.841	0.5114	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.972	0.78	1.16	1.05	0.507	1.24	0.0809	23.55%	0.00%
34122-009; 009		8	1.41	1.13	1.68	1.49	0.844	1.93	0.117	23.57%	-44.74%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.507	0.877	1.07	1.05	1.14	1.06	1.24	0.835
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.844	1.58	1.57

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	10-6406-0453	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed mean dry biomass-mg	16.21%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-010; 010*	4.08	1.86	0.158	8	CDF	0.0018	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.84	2.59	0.0112	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.478403	0.478403	1	16.7	0.0011	Significant Effect
Error	0.401945	0.0287103	14			
Total	0.880348		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	10.3	8.89	0.0064	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.905	0.841	0.0967	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	0.972	0.78	1.16	1.05	0.507	1.24	0.0809	23.55%	0.00%
34122-010; 010		8	0.626	0.566	0.685	0.612	0.543	0.765	0.0252	11.37%	35.59%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.507	0.877	1.07	1.05	1.14	1.06	1.24	0.835
34122-010; 010		0.616	0.673	0.609	0.654	0.562	0.543	0.765	0.585

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	07-9603-7153	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed mean dry biomass-mg	42.57%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-006; 006	-0.538	1.77	0.263	13	CDF	0.7000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.09	2.55	0.3604	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.023723	0.023723	1	0.289	0.5999	Non-Significant Effect
Error	1.06703	0.0820795	13			
Total	1.09076		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.25	9.16	0.3138	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.966	0.833	0.7907	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.617	0.3	0.933	0.712	0.04	1.04	0.129	55.47%	0.00%
34122-006; 006		8	0.696	0.506	0.887	0.721	0.308	1.01	0.0807	32.78%	-12.92%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.04	0.456	0.853	0.837	0.712	1.04	0.383	
34122-006; 006		0.881	0.829	0.783	0.642	0.658	0.308	1.01	0.463

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	07-1878-3310	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed mean dry biomass-mg	43.31%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-007; 007	-2.14	1.77	0.267	13	CDF	0.9741	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.05	2.55	0.4073	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.389818	0.389818	1	4.59	0.0517	Non-Significant Effect
Error	1.10449	0.084961	13			
Total	1.49431		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.04	9.16	0.3738	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.917	0.833	0.1717	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.617	0.3	0.933	0.712	0.04	1.04	0.129	55.47%	0.00%
34122-007; 007		8	0.94	0.74	1.14	1.02	0.407	1.18	0.0848	25.51%	-52.39%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.04	0.456	0.853	0.837	0.712	1.04	0.383	
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.407	0.883

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	21-0995-7986	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 passed mean dry biomass-mg	39.35%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-008; 008	1.24	1.77	0.243	13	CDF	0.1184	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.26	2.55	0.1901	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.107859	0.107859	1	1.54	0.2368	Non-Significant Effect
Error	0.91161	0.0701238	13			
Total	1.01947		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.91	9.16	0.0972	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.954	0.833	0.5912	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.617	0.3	0.933	0.712	0.04	1.04	0.129	55.47%	0.00%
34122-008; 008		8	0.447	0.302	0.591	0.393	0.275	0.725	0.0612	38.71%	27.56%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.04	0.456	0.853	0.837	0.712	1.04	0.383	
34122-008; 008		0.636	0.725	0.275	0.331	0.55	0.456	0.283	0.32

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	18-3265-5825	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed mean dry biomass-mg	49.99%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-009; 009	-4.53	1.77	0.308	13	CDF	0.9997	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.78	2.55	0.9353	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.32755	2.32755	1	20.6	5.6E-04	Significant Effect
Error	1.47131	0.113178	13			
Total	3.79887		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.07	9.16	0.9221	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.951	0.833	0.5411	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.617	0.3	0.933	0.712	0.04	1.04	0.129	55.47%	0.00%
34122-009; 009		8	1.41	1.13	1.68	1.49	0.844	1.93	0.117	23.57%	-128.02%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.04	0.456	0.853	0.837	0.712	1.04	0.383	
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.844	1.58	1.57

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	14-5319-8751	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 passed mean dry biomass-mg	41.50%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-010; 010	-0.0688	1.94	0.256	6	CDF	0.5263	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.51	2.55	0.0603	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0003070	0.0003070	1	0.00541	0.9425	Non-Significant Effect
Error	0.737661	0.0567432	13			
Total	0.737968		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	23.1	9.16	5.6E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.948	0.833	0.4970	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.617	0.3	0.933	0.712	0.04	1.04	0.129	55.47%	0.00%
34122-010; 010		8	0.626	0.566	0.685	0.612	0.543	0.765	0.0252	11.37%	-1.47%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.04	0.456	0.853	0.837	0.712	1.04	0.383	
34122-010; 010		0.616	0.673	0.609	0.654	0.562	0.543	0.765	0.585

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	15-5498-3288	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed mean dry biomass-mg	32.30%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-006; 006	-0.0107	1.77	0.225	13	CDF	0.5042	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.21	2.55	0.2360	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.875E-06	6.875E-06	1	0.000115	0.9916	Non-Significant Effect
Error	0.780318	0.0600245	13			
Total	0.780325		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.33	9.16	0.7123	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.934	0.833	0.3096	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	0.695	0.452	0.939	0.77	0.175	1.03	0.0995	37.86%	0.00%
34122-006; 006		8	0.696	0.506	0.887	0.721	0.308	1.01	0.0807	32.78%	-0.20%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.779	1.03	0.703	0.175	0.805	0.606	0.77	
34122-006; 006		0.881	0.829	0.783	0.642	0.658	0.308	1.01	0.463

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	04-3459-2035	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed mean dry biomass-mg	33.07%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-007; 007	-1.89	1.77	0.23	13	CDF	0.9591	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.2	2.55	0.2381	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.223685	0.223685	1	3.56	0.0819	Non-Significant Effect
Error	0.817777	0.062906	13			
Total	1.04146		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.2	9.16	0.8034	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.841	0.833	0.0130	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	0.695	0.452	0.939	0.77	0.175	1.03	0.0995	37.86%	0.00%
34122-007; 007		8	0.94	0.74	1.14	1.02	0.407	1.18	0.0848	25.51%	-35.21%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.779	1.03	0.703	0.175	0.805	0.606	0.77	
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.407	0.883

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	07-6161-8461	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed mean dry biomass-mg	28.91%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-008; 008*	2.19	1.77	0.201	13	CDF	0.0237	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.46	2.55	0.0768	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.230227	0.230227	1	4.79	0.0475	Significant Effect
Error	0.624894	0.0480688	13			
Total	0.855121		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.31	9.16	0.2967	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.947	0.833	0.4743	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	0.695	0.452	0.939	0.77	0.175	1.03	0.0995	37.86%	0.00%
34122-008; 008		8	0.447	0.302	0.591	0.393	0.275	0.725	0.0612	38.71%	35.72%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.779	1.03	0.703	0.175	0.805	0.606	0.77	
34122-008; 008		0.636	0.725	0.275	0.331	0.55	0.456	0.283	0.32

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	08-9990-5717	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed mean dry biomass-mg	39.80%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-009; 009	-4.55	1.77	0.277	13	CDF	0.9997	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.93	2.55	0.5993	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.88851	1.88851	1	20.7	5.4E-04	Significant Effect
Error	1.1846	0.0911229	13			
Total	3.07311		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.59	10.8	0.5902	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.943	0.833	0.4263	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	0.695	0.452	0.939	0.77	0.175	1.03	0.0995	37.86%	0.00%
34122-009; 009		8	1.41	1.13	1.68	1.49	0.844	1.93	0.117	23.57%	-102.31%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.779	1.03	0.703	0.175	0.805	0.606	0.77	
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.844	1.58	1.57

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-1491-4422	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 passed mean dry biomass-mg	28.68%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-010; 010	0.675	1.94	0.199	6	CDF	0.2623	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.9	2.55	0.0048	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0179235	0.0179235	1	0.517	0.4850	Non-Significant Effect
Error	0.450945	0.0346881	13			
Total	0.468869		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	13.7	9.16	0.0030	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.838	0.833	0.0116	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	0.695	0.452	0.939	0.77	0.175	1.03	0.0995	37.86%	0.00%
34122-010; 010		8	0.626	0.566	0.685	0.612	0.543	0.765	0.0252	11.37%	9.97%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.779	1.03	0.703	0.175	0.805	0.606	0.77	
34122-010; 010		0.616	0.673	0.609	0.654	0.562	0.543	0.765	0.585

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	01-9720-1267	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed mean dry biomass-mg	13.04%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-010; 010*	2.73	1.78	0.102	12	CDF	0.0092	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0835046	0.0835046	1	7.44	0.0184	Significant Effect
Error	0.134698	0.0112249	12			
Total	0.218203		13			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.92	9.52	0.1032	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.925	0.824	0.2560	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	6	0.782	0.634	0.93		0.606	1.03	0.0575	18.02%	0.00%
34122-010; 010		8	0.626	0.566	0.685		0.543	0.765	0.0252	11.37%	19.96%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	0.779	1.03	0.703	Outlier	0.805	0.606	0.77	
34122-010; 010		0.616	0.673	0.609	0.654	0.562	0.543	0.765	0.585

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	10-3941-4169	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed mean dry biomass-mg	35.45%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-006; 006	0.0767	1.77	0.251	13	CDF	0.4700	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.98	2.55	0.5157	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0004401	0.0004401	1	0.00588	0.9400	Non-Significant Effect
Error	0.972976	0.0748443	13			
Total	0.973416		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.94	9.16	0.4044	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.969	0.833	0.8454	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.707	0.413	1	0.797	0.185	1.14	0.12	45.01%	0.00%
34122-006; 006		8	0.696	0.506	0.887	0.721	0.308	1.01	0.0807	32.78%	1.53%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.863	0.907	1.14	0.617	0.797	0.185	0.444	
34122-006; 006		0.881	0.829	0.783	0.642	0.658	0.308	1.01	0.463

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-5218-9790	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed mean dry biomass-mg	36.12%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-007; 007	-1.61	1.77	0.256	13	CDF	0.9345	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.98	2.55	0.5151	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.201919	0.201919	1	2.6	0.1310	Non-Significant Effect
Error	1.01044	0.0777258	13			
Total	1.21235		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.76	9.16	0.4746	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.91	0.833	0.1373	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.707	0.413	1	0.797	0.185	1.14	0.12	45.01%	0.00%
34122-007; 007		8	0.94	0.74	1.14	1.02	0.407	1.18	0.0848	25.51%	-32.88%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.863	0.907	1.14	0.617	0.797	0.185	0.444	
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.407	0.883

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	15-1243-4636	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed mean dry biomass-mg	32.49%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-008; 008*	2.01	1.77	0.23	13	CDF	0.0330	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.16	2.55	0.2781	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.253431	0.253431	1	4.03	0.0660	Non-Significant Effect
Error	0.817552	0.0628886	13			
Total	1.07098		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.39	9.16	0.1354	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.978	0.833	0.9510	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.707	0.413	1	0.797	0.185	1.14	0.12	45.01%	0.00%
34122-008; 008		8	0.447	0.302	0.591	0.393	0.275	0.725	0.0612	38.71%	36.83%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.863	0.907	1.14	0.617	0.797	0.185	0.444	
34122-008; 008		0.636	0.725	0.275	0.331	0.55	0.456	0.283	0.32

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-3677-6530	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed mean dry biomass-mg	42.17%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-009; 009	-4.15	1.77	0.298	13	CDF	0.9994	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.79	2.55	0.9006	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.8242	1.8242	1	17.2	0.0011	Significant Effect
Error	1.37726	0.105943	13			
Total	3.20146		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.08	10.8	0.9378	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.953	0.833	0.5720	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.707	0.413	1	0.797	0.185	1.14	0.12	45.01%	0.00%
34122-009; 009		8	1.41	1.13	1.68	1.49	0.844	1.93	0.117	23.57%	-98.82%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.863	0.907	1.14	0.617	0.797	0.185	0.444	
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.844	1.58	1.57

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	19-3579-4152	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 passed mean dry biomass-mg	33.77%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-010; 010	0.663	1.94	0.239	6	CDF	0.2660	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.44	2.55	0.0880	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0247995	0.0247995	1	0.501	0.4916	Non-Significant Effect
Error	0.643604	0.049508	13			
Total	0.668403		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	20	9.16	8.9E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.94	0.833	0.3792	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.707	0.413	1	0.797	0.185	1.14	0.12	45.01%	0.00%
34122-010; 010		8	0.626	0.566	0.685	0.612	0.543	0.765	0.0252	11.37%	11.52%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	0.863	0.907	1.14	0.617	0.797	0.185	0.444	
34122-010; 010		0.616	0.673	0.609	0.654	0.562	0.543	0.765	0.585

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	07-7884-1377	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed mean dry biomass-mg	31.22%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-006; 006	0.962	1.76	0.262	14	CDF	0.1761	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.66	2.59	0.0326	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0820821	0.0820821	1	0.926	0.3522	Non-Significant Effect
Error	1.2408	0.0886282	14			
Total	1.32288		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.4	8.89	0.2706	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.857	0.841	0.0173	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.84	0.544	1.14	0.985	0.0735	1.1	0.125	42.13%	0.00%
34122-006; 006		8	0.696	0.506	0.887	0.721	0.308	1.01	0.0807	32.78%	17.06%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.903	1.03	1.1	0.968	1	0.559	1.09	0.0735
34122-006; 006		0.881	0.829	0.783	0.642	0.658	0.308	1.01	0.463

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	09-7323-3324	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 failed mean dry biomass-mg	20.21%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-006; 006*	2.33	1.77	0.192	13	CDF	0.0182	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.238427	0.238427	1	5.44	0.0364	Significant Effect
Error	0.56978	0.0438292	13			
Total	0.808207		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.53	10.8	0.6229	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.908	0.833	0.1252	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	7	0.949	0.778	1.12		0.559	1.1	0.0699	19.47%	0.00%
34122-006; 006		8	0.696	0.506	0.887		0.308	1.01	0.0807	32.78%	26.62%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.903	1.03	1.1	0.968	1	0.559	1.09	Outlier
34122-006; 006		0.881	0.829	0.783	0.642	0.658	0.308	1.01	0.463

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-5193-1301	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed mean dry biomass-mg	20.87%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-007; 007	63	n/a	0	13	Exact	0.4775	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0003225	0.0003225	1	0.0069	0.9350	Non-Significant Effect
Error	0.607239	0.0467107	13			
Total	0.607562		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.68	10.8	0.5429	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.81	0.833	0.0049	Non-Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	7	0.949	0.778	1.12	1	0.559	1.1	0.0699	19.47%	0.00%
34122-007; 007		8	0.94	0.74	1.14	1.02	0.407	1.18	0.0848	25.51%	0.98%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.903	1.03	1.1	0.968	1	0.559	1.09	Outlier
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.407	0.883

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	02-1485-8859	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed mean dry biomass-mg	29.20%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-008; 008*	2.82	1.76	0.245	14	CDF	0.0068	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.85	2.59	0.0102	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.617599	0.617599	1	7.97	0.0136	Significant Effect
Error	1.08537	0.0775265	14			
Total	1.70297		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	4.18	8.89	0.0785	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.85	0.841	0.0137	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.84	0.544	1.14	0.985	0.0735	1.1	0.125	42.13%	0.00%
34122-008; 008		8	0.447	0.302	0.591	0.393	0.275	0.725	0.0612	38.71%	46.79%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.903	1.03	1.1	0.968	1	0.559	1.09	0.0735
34122-008; 008		0.636	0.725	0.275	0.331	0.55	0.456	0.283	0.32

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-1431-6206	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed mean dry biomass-mg	35.95%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-009; 009	-3.31	1.76	0.302	14	CDF	0.9974	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.31	2.59	0.1743	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.28426	1.28426	1	10.9	0.0052	Significant Effect
Error	1.64507	0.117505	14			
Total	2.92933		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.14	8.89	0.8681	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.896	0.841	0.0706	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.84	0.544	1.14	0.985	0.0735	1.1	0.125	42.13%	0.00%
34122-009; 009		8	1.41	1.13	1.68	1.49	0.844	1.93	0.117	23.57%	-67.48%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.903	1.03	1.1	0.968	1	0.559	1.09	0.0735
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.844	1.58	1.57

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-8791-5579	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed mean dry biomass-mg	26.76%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-010; 010*	51	n/a	0	14	Exact	0.0415	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	3.11	2.59	0.0012	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.183005	0.183005	1	2.81	0.1158	Non-Significant Effect
Error	0.911422	0.0651016	14			
Total	1.09443		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	24.7	8.89	4.0E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.791	0.841	0.0021	Non-Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	0.84	0.544	1.14	0.985	0.0735	1.1	0.125	42.13%	0.00%
34122-010; 010		8	0.626	0.566	0.685	0.612	0.543	0.765	0.0252	11.37%	25.47%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.903	1.03	1.1	0.968	1	0.559	1.09	0.0735
34122-010; 010		0.616	0.673	0.609	0.654	0.562	0.543	0.765	0.585

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	12-8192-9551	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed mean dry biomass-mg	24.46%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-006; 006	1.24	1.8	0.205	11	CDF	0.1200	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.03	2.46	0.3542	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0618685	0.0618685	1	1.54	0.2401	Non-Significant Effect
Error	0.441239	0.0401126	11			
Total	0.503107		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.73	21.6	0.3489	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.97	0.814	0.8888	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	0.838	0.667	1.01	0.837	0.632	1.02	0.0618	16.49%	0.00%
34122-006; 006		8	0.696	0.506	0.887	0.721	0.308	1.01	0.0807	32.78%	16.92%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.833	0.872	1.02	0.837	0.632			
34122-006; 006		0.881	0.829	0.783	0.642	0.658	0.308	1.01	0.463

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	21-1669-9014	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed mean dry biomass-mg	25.48%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-007; 007	-0.854	1.8	0.214	11	CDF	0.7945	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.67	2.46	0.0130	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0317741	0.0317741	1	0.73	0.4111	Non-Significant Effect
Error	0.478698	0.043518	11			
Total	0.510472		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.01	21.6	0.3039	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.861	0.814	0.0402	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	0.838	0.667	1.01	0.837	0.632	1.02	0.0618	16.49%	0.00%
34122-007; 007		8	0.94	0.74	1.14	1.02	0.407	1.18	0.0848	25.51%	-12.12%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.833	0.872	1.02	0.837	0.632			
34122-007; 007		1.06	0.975	1.07	1.18	1.08	0.863	0.407	0.883

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	08-7203-6801	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed mean dry biomass-mg	19.69%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-008; 008*	4.26	1.8	0.165	11	CDF	6.7E-04	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.8	2.46	0.7338	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.471576	0.471576	1	18.1	0.0013	Significant Effect
Error	0.285815	0.0259832	11			
Total	0.757391		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.57	21.6	0.6967	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.942	0.814	0.4878	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	0.838	0.667	1.01	0.837	0.632	1.02	0.0618	16.49%	0.00%
34122-008; 008		8	0.447	0.302	0.591	0.393	0.275	0.725	0.0612	38.71%	46.70%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.833	0.872	1.02	0.837	0.632			
34122-008; 008		0.636	0.725	0.275	0.331	0.55	0.456	0.283	0.32

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	17-0702-8260	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed mean dry biomass-mg	33.86%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-009; 009	-3.59	1.8	0.284	11	CDF	0.9979	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.12	2.46	0.2511	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.992951	0.992951	1	12.9	0.0042	Significant Effect
Error	0.845518	0.0768653	11			
Total	1.83847		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.75	21.6	0.1102	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.954	0.814	0.6604	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	0.838	0.667	1.01	0.837	0.632	1.02	0.0618	16.49%	0.00%
34122-009; 009		8	1.41	1.13	1.68	1.49	0.844	1.93	0.117	23.57%	-67.77%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.833	0.872	1.02	0.837	0.632			
34122-009; 009		1.53	1.45	1.14	1.93	1.22	0.844	1.58	1.57

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	12-6412-6382	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed mean dry biomass-mg	12.32%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-010; 010*	3.7	1.8	0.103	11	CDF	0.0018	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.14	2.46	0.2292	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.138872	0.138872	1	13.7	0.0035	Significant Effect
Error	0.111866	0.0101696	11			
Total	0.250738		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.77	10.1	0.1216	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.952	0.814	0.6238	Normal Distribution

Mean Dry Biomass-mg Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	0.838	0.667	1.01	0.837	0.632	1.02	0.0618	16.49%	0.00%
34122-010; 010		8	0.626	0.566	0.685	0.612	0.543	0.765	0.0252	11.37%	25.34%

Mean Dry Biomass-mg Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	0.833	0.872	1.02	0.837	0.632			
34122-010; 010		0.616	0.673	0.609	0.654	0.562	0.543	0.765	0.585

28 day *Leptocheirus plumulosus* Survival, Growth and Reproduction Sediment Evaluation

CETIS™ Summary, Ad Hoc Query and Analytical Reports

Reproduction Statistical Analysis

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test **Enthalpy Analytical, LLC**

Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h		
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d		
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d		
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d		
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h		
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
09-3235-3868	Reproduction	Equal Variance t Two-Sample Test	0.0020	34122-001; 001 failed reproduction	1
02-5643-8992	Reproduction	Equal Variance t Two-Sample Test	0.0180	34122-002; 002 failed reproduction	1
20-8611-6525	Reproduction	Equal Variance t Two-Sample Test	0.0108	34122-003; 003 failed reproduction	1
06-1203-7597	Reproduction	Equal Variance t Two-Sample Test	0.0425	34122-004; 004 failed reproduction	1
09-4472-5746	Reproduction	Equal Variance t Two-Sample Test	0.0542	34122-005; 005 passed reproduction	1
09-0652-9174	Reproduction	Equal Variance t Two-Sample Test	1.1E-04	34122-006; 006 failed reproduction	1
14-1943-4475	Reproduction	Equal Variance t Two-Sample Test	0.1613	34122-006; 006 passed reproduction	1
16-1384-3590	Reproduction	Equal Variance t Two-Sample Test	0.3763	34122-006; 006 passed reproduction	1
00-8230-6267	Reproduction	Unequal Variance t Two-Sample Test	0.0193	34122-006; 006 failed reproduction	1
01-6442-7144	Reproduction	Unequal Variance t Two-Sample Test	0.0015	34122-006; 006 failed reproduction	1
14-3390-7238	Reproduction	Unequal Variance t Two-Sample Test	0.0731	34122-006; 006 passed reproduction	1
17-8184-2481	Reproduction	Unequal Variance t Two-Sample Test	0.0322	34122-006; 006 failed reproduction	1
02-5224-8485	Reproduction	Equal Variance t Two-Sample Test	0.9408	34122-007; 007 passed reproduction	1
04-4029-5359	Reproduction	Equal Variance t Two-Sample Test	0.9078	34122-007; 007 passed reproduction	1
06-7657-3641	Reproduction	Equal Variance t Two-Sample Test	0.9845	34122-007; 007 passed reproduction	1
09-8435-2406	Reproduction	Equal Variance t Two-Sample Test	0.8247	34122-007; 007 passed reproduction	1
18-8248-3305	Reproduction	Equal Variance t Two-Sample Test	0.2281	34122-007; 007 passed reproduction	1
21-2698-7888	Reproduction	Equal Variance t Two-Sample Test	0.7974	34122-007; 007 passed reproduction	1
01-1300-2145	Reproduction	Equal Variance t Two-Sample Test	0.0121	34122-008; 008 failed reproduction	1
04-9171-9486	Reproduction	Equal Variance t Two-Sample Test	0.0078	34122-008; 008 failed reproduction	1
08-2974-2154	Reproduction	Equal Variance t Two-Sample Test	2.1E-04	34122-008; 008 failed reproduction	1
10-8035-8139	Reproduction	Equal Variance t Two-Sample Test	0.0940	34122-008; 008 passed reproduction	1
15-7375-4114	Reproduction	Equal Variance t Two-Sample Test	0.0344	34122-008; 008 failed reproduction	1
02-5068-7328	Reproduction	Unequal Variance t Two-Sample Test	8.7E-04	34122-008; 008 failed reproduction	1

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test **Enthalpy Analytical, LLC**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
11-8925-7191	Reproduction	Equal Variance t Two-Sample Test	0.9270	34122-009; 009 passed reproduction	1
18-2326-6541	Reproduction	Equal Variance t Two-Sample Test	0.9948	34122-009; 009 passed reproduction	1
18-7515-4379	Reproduction	Equal Variance t Two-Sample Test	0.9931	34122-009; 009 passed reproduction	1
21-4199-8528	Reproduction	Equal Variance t Two-Sample Test	0.9963	34122-009; 009 passed reproduction	1
02-1947-8975	Reproduction	Unequal Variance t Two-Sample Test	0.9896	34122-009; 009 passed reproduction	1
14-5728-8449	Reproduction	Unequal Variance t Two-Sample Test	0.9970	34122-009; 009 passed reproduction	1
10-8405-1247	Reproduction	Equal Variance t Two-Sample Test	0.0158	34122-010; 010 failed reproduction	1
12-2190-7716	Reproduction	Equal Variance t Two-Sample Test	1.4E-04	34122-010; 010 failed reproduction	1
15-1042-5341	Reproduction	Equal Variance t Two-Sample Test	0.0456	34122-010; 010 failed reproduction	1
17-9201-8183	Reproduction	Equal Variance t Two-Sample Test	0.1331	34122-010; 010 passed reproduction	1
14-2251-4557	Reproduction	Unequal Variance t Two-Sample Test	0.0155	34122-010; 010 failed reproduction	1
14-5854-3140	Reproduction	Unequal Variance t Two-Sample Test	0.0014	34122-010; 010 failed reproduction	1

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
34122-000; 000	LC	8	2.39	1.35	3.43	0.3	4.05	0.44	1.24	52.11%	0.00%
34122-001; 001	R1	7	0.607	0.0926	1.12	0.1	1.65	0.21	0.556	91.63%	74.57%
34122-002; 002	R2	7	1.09	0.332	1.85	0	2.35	0.311	0.822	75.24%	54.23%
34122-003; 003	R3	7	0.929	0.141	1.72	0	2.05	0.322	0.851	91.69%	61.11%
34122-004; 004	R4	8	1.33	0.475	2.19	0	2.7	0.362	1.02	76.97%	44.24%
34122-005; 005	R5	5	1.37	0.87	1.87	0.75	1.7	0.18	0.402	29.38%	42.62%
34122-006; 006		8	0.381	0.161	0.601	0	0.7	0.093	0.263	69.02%	84.03%
34122-007; 007		8	1.9	0.805	2.99	0	4.15	0.462	1.31	68.89%	20.48%
34122-008; 008		8	0.269	-0.0503	0.588	0	1.1	0.135	0.382	142.02%	88.74%
34122-009; 009		8	3.78	1.91	5.65	1.2	7.8	0.791	2.24	59.20%	-58.38%
34122-010; 010		8	0.343	0.0871	0.599	0	0.95	0.108	0.306	89.22%	85.64%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.3	2.25	4.05	1.45	2.5	2.25	2.25	4.05
34122-001; 001	R1		0.1	0.5	0.2	1.65	1.05	0.5	0.25
34122-002; 002	R2		1.8	2.35	0.5	0	1.45	0.55	1
34122-003; 003	R3	1.8		2.05	1.3	0.2	1.1	0	0.05
34122-004; 004	R4	0.75	2.7	1.6	0.8	2.7	0.35	1.75	0
34122-005; 005	R5	1.2		1.5	1.7	1.7			0.75
34122-006; 006		0.2	0.5	0.6	0.25	0.7	0.15	0.65	0
34122-007; 007		1.4	2.35	2.9	4.15	2.35	1.24	0	0.8
34122-008; 008		0.15	1.1	0.2	0	0.55	0	0.15	0
34122-009; 009		2.9	3.4	1.8	7.8	5.15	2.35	1.2	5.65
34122-010; 010		0.35	0.143	0.3	0.1	0.6	0.95	0.3	0

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28-day Survival, Growth and Reproduction Sediment Evaluation
TASK: Statistical Analysis of Juveniles Produced per Surviving Adult

Station	Method	C (H_0)	>	T (H_1)	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Sed-321-C120-0-0.5; 34122-001	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-001; 001	3.481618	1.77093	0.00202725	0.05	TRUE	0.905583	13		C
Sed-322-C120-0-0.5; 34122-002	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-002; 002	2.337274	1.77093	0.01803559	0.05	TRUE	0.98094	13		C
Sed-323-C120-0-0.5; 34122-003	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-003; 003	2.608403	1.77093	0.01082891	0.05	TRUE	0.990516	13		C
Sed-324-C120-0-0.5; 34122-004	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-004; 004	1.853629	1.76131	0.04249085	0.05	TRUE	1.003644	14		C
Sed-325-C120-0-0.5; 34122-005	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-005; 005	1.746968	1.79589	0.05423275	0.05	FALSE	1.045991	11		C
Sed-331-C120-0-0.5; 34122-006	Unequal Variance t Two-Sample Test	34122-000; 000	>	34122-006; 006	4.462578	1.89458	0.00146348	0.05	TRUE	0.851749	7		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-007; 007	0.7661889	1.76131	0.2281446	0.05	FALSE	1.124083	14		C
Sed-335-C120-0-0.5; 34122-008	Unequal Variance t Two-Sample Test	34122-000; 000	>	34122-008; 008	4.605233	1.85955	0.00087174	0.05	TRUE	0.855531	8		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-009; 009	-1.539333	1.76131	0.9269923	0.05	FALSE	1.594733	14		C
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-000; 000	>	34122-010; 010	4.514141	1.89458	0.00137568	0.05	TRUE	0.858134	7		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-006; 006	1.028359	1.77093	0.1612677	0.05	FALSE	0.389009	13		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-006; 006	0.3225091	1.78229	0.3763084	0.05	FALSE	0.287829	12		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-007; 007	-2.418891	1.77093	0.9845152	0.05	FALSE	0.945445	13		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-008; 008	1.389902	1.77093	0.09395058	0.05	FALSE	0.431161	13		C
Sed-337-C120-0-0.5; 34122-009	Unequal Variance t Two-Sample Test	34122-001; 001	>	34122-009; 009	-3.876194	1.89458	0.9969586	0.05	FALSE	1.551417	7		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-010; 010	1.16164	1.77093	0.1331332	0.05	FALSE	0.402907	13		C
Sed-331-C120-0-0.5; 34122-006	Unequal Variance t Two-Sample Test	34122-002; 002	>	34122-006; 006	2.193418	1.89458	0.03217661	0.05	TRUE	0.614655	7		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-007; 007	-1.401732	1.77093	0.9077914	0.05	FALSE	1.017855	13		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-008; 008	2.548047	1.77093	0.01214108	0.05	TRUE	0.572768	13		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-009; 009	-2.993972	1.77093	0.9948208	0.05	FALSE	1.590183	13		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-010; 010	2.406978	1.77093	0.01583427	0.05	TRUE	0.551812	13		C
Sed-331-C120-0-0.5; 34122-006	Unequal Variance t Two-Sample Test	34122-003; 003	>	34122-006; 006	1.633908	1.89458	0.07314762	0.05	FALSE	0.63464	7		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-007; 007	-1.6724	1.77093	0.940837	0.05	FALSE	1.027087	13		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-008; 008	1.983814	1.77093	0.03440186	0.05	TRUE	0.589017	13		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-009; 009	-3.165138	1.77093	0.9962744	0.05	FALSE	1.596108	13		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-010; 010	1.824042	1.77093	0.04560437	0.05	TRUE	0.568661	13		C
Sed-331-C120-0-0.5; 34122-006	Unequal Variance t Two-Sample Test	34122-004; 004	>	34122-006; 006	2.539893	1.89458	0.01933503	0.05	TRUE	0.708632	7		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-007; 007	-0.965639	1.76131	0.8246948	0.05	FALSE	1.034677	14		C

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28-day Survival, Growth and Reproduction Sediment Evaluation
TASK: Statistical Analysis of Juveniles Produced per Surviving Adult

Station	Method	C (H_0)	>	T (H_1)	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-008; 008	2.748378	1.76131	0.00784745	0.05	TRUE	0.680908	14		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-009; 009	-2.814831	1.76131	0.9931139	0.05	FALSE	1.533026	14		C
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-004; 004	>	34122-010; 010	2.614276	1.85955	0.0154621	0.05	TRUE	0.703049	8		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-006; 006	5.404881	1.79589	0.00010753	0.05	TRUE	0.328533	11		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-007; 007	-0.865402	1.79589	0.7973515	0.05	FALSE	1.09677	11		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-008; 008	4.96116	1.79589	0.000214	0.05	TRUE	0.39864	11		C
Sed-337-C120-0-0.5; 34122-009	Unequal Variance t Two-Sample Test	34122-005; 005	>	34122-009; 009	-2.970895	1.89458	0.9896093	0.05	FALSE	1.537686	7		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-010; 010	5.234959	1.79589	0.00013949	0.05	TRUE	0.352368	11		C

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	09-3235-3868	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:35	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-001; 001 failed reproduction	37.93%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 1*	3.48	1.77	0.906	13	CDF	0.0020	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.19	2.55	0.2477	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	11.8334	11.8334	1	12.1	0.0041	Significant Effect
Error	12.6909	0.976223	13			
Total	24.5243		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5	10.8	0.0678	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.913	0.833	0.1528	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	2.39	1.35	3.43		0.3	4.05	0.44	52.11%	0.00%
34122-001; 001	R1	7	0.607	0.0926	1.12		0.1	1.65	0.21	91.63%	74.57%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.3	2.25	4.05	1.45	2.5	2.25	2.25	4.05
34122-001; 001	R1	0.1	0.5	0.2	1.65	1.05	0.5	0.25	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	02-5643-8992	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:35	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-002; 002 failed reproduction	41.09%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 2*	2.34	1.77	0.981	13	CDF	0.0180	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.02	2.55	0.4492	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.25744	6.25744	1	5.46	0.0361	Significant Effect
Error	14.8909	1.14545	13			
Total	21.1483		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.29	10.8	0.3325	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.959	0.833	0.6798	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	2.39	1.35	3.43		0.3	4.05	0.44	52.11%	0.00%
34122-002; 002	R2	7	1.09	0.332	1.85		0	2.35	0.311	75.24%	54.23%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.3	2.25	4.05	1.45	2.5	2.25	2.25	4.05
34122-002; 002	R2	1.8	2.35	0.5	0	1.45	0.55	1	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	20-8611-6525	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-003; 003 failed reproduction	41.49%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 3*	2.61	1.77	0.991	13	CDF	0.0108	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2	2.55	0.4789	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7.9463	7.9463	1	6.8	0.0217	Significant Effect
Error	15.183	1.16793	13			
Total	23.1293		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.14	10.8	0.3743	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.96	0.833	0.6925	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	2.39	1.35	3.43		0.3	4.05	0.44	52.11%	0.00%
34122-003; 003	R3	7	0.929	0.141	1.72		0	2.05	0.322	91.69%	61.11%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.3	2.25	4.05	1.45	2.5	2.25	2.25	4.05
34122-003; 003	R3	1.8	2.05	1.3	0.2	1.1	0	0.05	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	06-1203-7597	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-004; 004 failed reproduction	42.04%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 4*	1.85	1.76	1	14	CDF	0.0425	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.9	2.59	0.7316	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.46266	4.46266	1	3.44	0.0850	Non-Significant Effect
Error	18.1834	1.29882	14			
Total	22.6461		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.47	8.89	0.6214	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.952	0.841	0.5212	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	2.39	1.35	3.43		0.3	4.05	0.44	52.11%	0.00%
34122-004; 004	R4	8	1.33	0.475	2.19		0	2.7	0.362	76.97%	44.24%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.3	2.25	4.05	1.45	2.5	2.25	2.25	4.05
34122-004; 004	R4	0.75	2.7	1.6	0.8	2.7	0.35	1.75	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	09-4472-5746	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-005; 005 passed reproduction	43.81%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 5	1.75	1.8	1.05	11	CDF	0.0542	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.13	2.46	0.2364	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.18556	3.18556	1	3.05	0.1085	Non-Significant Effect
Error	11.4817	1.0438	11			
Total	14.6673		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	9.55	21.6	0.0456	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.909	0.814	0.1801	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	2.39	1.35	3.43		0.3	4.05	0.44	52.11%	0.00%
34122-005; 005	R5	5	1.37	0.87	1.87		0.75	1.7	0.18	29.38%	42.62%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.3	2.25	4.05	1.45	2.5	2.25	2.25	4.05
34122-005; 005	R5	1.2	1.5	1.7	1.7	0.75			

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	01-6442-7144	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 failed reproduction	35.68%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-006; 006*	4.46	1.89	0.852	7	CDF	0.0015	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.4	2.59	0.1196	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	16.1002	16.1002	1	19.9	5.4E-04	Significant Effect
Error	11.3184	0.80846	14			
Total	27.4186		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	22.4	8.89	5.6E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.862	0.841	0.0208	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	2.39	1.35	3.43		0.3	4.05	0.44	52.11%	0.00%
34122-006; 006		8	0.381	0.161	0.601		0	0.7	0.093	69.02%	84.03%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.3	2.25	4.05	1.45	2.5	2.25	2.25	4.05
34122-006; 006		0.2	0.5	0.6	0.25	0.7	0.15	0.65	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	18-8248-3305	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed reproduction	47.08%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-007; 007	0.766	1.76	1.12	14	CDF	0.2281	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.83	2.59	0.8927	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.956437	0.956437	1	0.587	0.4563	Non-Significant Effect
Error	22.8094	1.62924	14			
Total	23.7658		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.11	8.89	0.8982	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.972	0.841	0.8703	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	2.39	1.35	3.43		0.3	4.05	0.44	52.11%	0.00%
34122-007; 007		8	1.9	0.805	2.99		0	4.15	0.462	68.89%	20.48%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.3	2.25	4.05	1.45	2.5	2.25	2.25	4.05
34122-007; 007		1.4	2.35	2.9	4.15	2.35	1.24	0	0.8

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	02-5068-7328	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed reproduction	35.83%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-008; 008*	4.61	1.86	0.856	8	CDF	8.7E-04	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.35	2.59	0.1512	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	17.9564	17.9564	1	21.2	4.1E-04	Significant Effect
Error	11.8534	0.846674	14			
Total	29.8098		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	10.6	8.89	0.0059	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.864	0.841	0.0217	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	2.39	1.35	3.43		0.3	4.05	0.44	52.11%	0.00%
34122-008; 008		8	0.269	-0.0503	0.588		0	1.1	0.135	142.02%	88.74%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.3	2.25	4.05	1.45	2.5	2.25	2.25	4.05
34122-008; 008		0.15	1.1	0.2	0	0.55	0	0.15	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-8925-7191	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed reproduction	66.80%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-009; 009	-1.54	1.76	1.59	14	CDF	0.9270	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.3	2.59	0.1863	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7.77016	7.77016	1	2.37	0.1460	Non-Significant Effect
Error	45.9084	3.27917	14			
Total	53.6786		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.24	8.89	0.1440	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.95	0.841	0.4934	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	2.39	1.35	3.43		0.3	4.05	0.44	52.11%	0.00%
34122-009; 009		8	3.78	1.91	5.65		1.2	7.8	0.791	59.20%	-58.38%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.3	2.25	4.05	1.45	2.5	2.25	2.25	4.05
34122-009; 009		2.9	3.4	1.8	7.8	5.15	2.35	1.2	5.65

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	14-5854-3140	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed reproduction	35.94%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-010; 010*	4.51	1.89	0.858	7	CDF	0.0014	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.39	2.59	0.1293	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	16.7223	16.7223	1	20.4	4.9E-04	Significant Effect
Error	11.4888	0.820625	14			
Total	28.211		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	16.5	8.89	0.0015	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.867	0.841	0.0243	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	2.39	1.35	3.43		0.3	4.05	0.44	52.11%	0.00%
34122-010; 010		8	0.343	0.0871	0.599		0	0.95	0.108	89.22%	85.64%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.3	2.25	4.05	1.45	2.5	2.25	2.25	4.05
34122-010; 010		0.35	0.143	0.3	0.1	0.6	0.95	0.3	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	16-1384-3590	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed reproduction	66.42%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-006; 006	0.323	1.78	0.288	12	CDF	0.3763	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0093006	0.0093006	1	0.104	0.7526	Non-Significant Effect
Error	1.07302	0.0894184	12			
Total	1.08232		13			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.7	9.52	0.5051	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.942	0.824	0.4401	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	6	0.433	0.0733	0.793		0.1	1.05	0.14	79.16%	0.00%
34122-006; 006		8	0.381	0.161	0.601		0	0.7	0.093	69.02%	12.02%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.1	0.5	0.2	Outlier	1.05	0.5	0.25	
34122-006; 006		0.2	0.5	0.6	0.25	0.7	0.15	0.65	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	06-7657-3641	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed reproduction	155.72%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-007; 007	-2.42	1.77	0.945	13	CDF	0.9845	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.27	2.55	0.1865	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.22583	6.22583	1	5.85	0.0310	Significant Effect
Error	13.8327	1.06406	13			
Total	20.0586		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.53	10.8	0.0537	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.965	0.833	0.7832	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.607	0.0926	1.12		0.1	1.65	0.21	91.63%	0.00%
34122-007; 007		8	1.9	0.805	2.99		0	4.15	0.462	68.89%	-212.70%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.1	0.5	0.2	1.65	1.05	0.5	0.25	
34122-007; 007		1.4	2.35	2.9	4.15	2.35	1.24	0	0.8

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	10-8035-8139	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 passed reproduction	71.01%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-008; 008	1.39	1.77	0.431	13	CDF	0.0940	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.3	2.55	0.1612	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.427503	0.427503	1	1.93	0.1879	Non-Significant Effect
Error	2.87683	0.221295	13			
Total	3.30433		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.12	9.16	0.3468	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.838	0.833	0.0117	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.607	0.0926	1.12		0.1	1.65	0.21	91.63%	0.00%
34122-008; 008		8	0.269	-0.0503	0.588		0	1.1	0.135	142.02%	55.74%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.1	0.5	0.2	1.65	1.05	0.5	0.25	
34122-008; 008		0.15	1.1	0.2	0	0.55	0	0.15	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	14-5728-8449	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed reproduction	255.53%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-009; 009	-3.88	1.89	1.55	7	CDF	0.9970	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.47	2.55	0.0732	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	37.6132	37.6132	1	13.2	0.0030	Significant Effect
Error	36.9318	2.84091	13			
Total	74.545		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	16.2	10.8	0.0033	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.942	0.833	0.4090	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.607	0.0926	1.12		0.1	1.65	0.21	91.63%	0.00%
34122-009; 009		8	3.78	1.91	5.65		1.2	7.8	0.791	59.20%	-522.79%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.1	0.5	0.2	1.65	1.05	0.5	0.25	
34122-009; 009		2.9	3.4	1.8	7.8	5.15	2.35	1.2	5.65

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	17-9201-8183	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 passed reproduction	66.36%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-010; 010	1.16	1.77	0.403	13	CDF	0.1331	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.46	2.55	0.0778	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.260762	0.260762	1	1.35	0.2663	Non-Significant Effect
Error	2.51214	0.193242	13			
Total	2.7729		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.31	9.16	0.1428	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.891	0.833	0.0699	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	0.607	0.0926	1.12		0.1	1.65	0.21	91.63%	0.00%
34122-010; 010		8	0.343	0.0871	0.599		0	0.95	0.108	89.22%	43.53%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	0.1	0.5	0.2	1.65	1.05	0.5	0.25	
34122-010; 010		0.35	0.143	0.3	0.1	0.6	0.95	0.3	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	17-8184-2481	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 failed reproduction	56.24%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-006; 006*	2.19	1.89	0.615	7	CDF	0.0322	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.21	2.55	0.2343	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.8905	1.8905	1	5.41	0.0368	Significant Effect
Error	4.54183	0.349372	13			
Total	6.43233		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	9.77	9.16	0.0083	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.98	0.833	0.9701	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	1.09	0.332	1.85		0	2.35	0.311	75.24%	0.00%
34122-006; 006		8	0.381	0.161	0.601		0	0.7	0.093	69.02%	65.11%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	1.8	2.35	0.5	0	1.45	0.55	1	
34122-006; 006		0.2	0.5	0.6	0.25	0.7	0.15	0.65	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	04-4029-5359	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed reproduction	93.14%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-007; 007	-1.4	1.77	1.02	13	CDF	0.9078	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.1	2.55	0.3424	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.42323	2.42323	1	1.96	0.1844	Non-Significant Effect
Error	16.0327	1.23329	13			
Total	18.456		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.53	10.8	0.2784	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.979	0.833	0.9603	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	1.09	0.332	1.85		0	2.35	0.311	75.24%	0.00%
34122-007; 007		8	1.9	0.805	2.99		0	4.15	0.462	68.89%	-73.72%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	1.8	2.35	0.5	0	1.45	0.55	1	
34122-007; 007		1.4	2.35	2.9	4.15	2.35	1.24	0	0.8

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	01-1300-2145	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed reproduction	52.41%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-008; 008*	2.55	1.77	0.573	13	CDF	0.0121	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.09	2.55	0.3624	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.5355	2.5355	1	6.49	0.0243	Significant Effect
Error	5.07683	0.390525	13			
Total	7.61233		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	4.64	9.16	0.0641	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.956	0.833	0.6301	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	1.09	0.332	1.85		0	2.35	0.311	75.24%	0.00%
34122-008; 008		8	0.269	-0.0503	0.588		0	1.1	0.135	142.02%	75.41%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	1.8	2.35	0.5	0	1.45	0.55	1	
34122-008; 008		0.15	1.1	0.2	0	0.55	0	0.15	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	18-2326-6541	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed reproduction	145.51%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-009; 009	-2.99	1.77	1.59	13	CDF	0.9948	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.4	2.55	0.1025	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	26.9825	26.9825	1	8.96	0.0104	Significant Effect
Error	39.1318	3.01014	13			
Total	66.1143		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.41	10.8	0.0263	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.96	0.833	0.6968	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	1.09	0.332	1.85		0	2.35	0.311	75.24%	0.00%
34122-009; 009		8	3.78	1.91	5.65		1.2	7.8	0.791	59.20%	-246.00%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	1.8	2.35	0.5	0	1.45	0.55	1	
34122-009; 009		2.9	3.4	1.8	7.8	5.15	2.35	1.2	5.65

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	10-8405-1247	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed reproduction	50.49%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-010; 010*	2.41	1.77	0.552	13	CDF	0.0158	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.17	2.55	0.2727	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.1	2.1	1	5.79	0.0317	Significant Effect
Error	4.71214	0.362473	13			
Total	6.81214		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.23	9.16	0.0197	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.978	0.833	0.9511	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	1.09	0.332	1.85		0	2.35	0.311	75.24%	0.00%
34122-010; 010		8	0.343	0.0871	0.599		0	0.95	0.108	89.22%	68.63%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	1.8	2.35	0.5	0	1.45	0.55	1	
34122-010; 010		0.35	0.143	0.3	0.1	0.6	0.95	0.3	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	14-3390-7238	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed reproduction	68.35%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-006; 006	1.63	1.89	0.635	7	CDF	0.0731	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.91	2.55	0.6462	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.11836	1.11836	1	3.01	0.1065	Non-Significant Effect
Error	4.83397	0.371844	13			
Total	5.95233		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	10.5	9.16	0.0067	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.962	0.833	0.7253	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.929	0.141	1.72		0	2.05	0.322	91.69%	0.00%
34122-006; 006		8	0.381	0.161	0.601		0	0.7	0.093	69.02%	58.94%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	1.8	2.05	1.3	0.2	1.1	0	0.05	
34122-006; 006		0.2	0.5	0.6	0.25	0.7	0.15	0.65	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	02-5224-8485	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed reproduction	110.61%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-007; 007	-1.67	1.77	1.03	13	CDF	0.9408	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.09	2.55	0.3657	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.51226	3.51226	1	2.8	0.1183	Non-Significant Effect
Error	16.3249	1.25576	13			
Total	19.8371		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.36	10.8	0.3152	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.969	0.833	0.8390	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.929	0.141	1.72		0	2.05	0.322	91.69%	0.00%
34122-007; 007		8	1.9	0.805	2.99		0	4.15	0.462	68.89%	-104.46%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	1.8	2.05	1.3	0.2	1.1	0	0.05	
34122-007; 007		1.4	2.35	2.9	4.15	2.35	1.24	0	0.8

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	15-7375-4114	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed reproduction	63.43%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-008; 008*	1.98	1.77	0.589	13	CDF	0.0344	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.81	2.55	0.8571	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.62536	1.62536	1	3.94	0.0688	Non-Significant Effect
Error	5.36897	0.412998	13			
Total	6.99433		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	4.98	9.16	0.0538	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.95	0.833	0.5307	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.929	0.141	1.72		0	2.05	0.322	91.69%	0.00%
34122-008; 008		8	0.269	-0.0503	0.588		0	1.1	0.135	142.02%	71.06%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	1.8	2.05	1.3	0.2	1.1	0	0.05	
34122-008; 008		0.15	1.1	0.2	0	0.55	0	0.15	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	21-4199-8528	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed reproduction	171.89%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-009; 009	-3.17	1.77	1.6	13	CDF	0.9963	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.39	2.55	0.1068	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	30.381	30.381	1	10	0.0075	Significant Effect
Error	39.424	3.03261	13			
Total	69.805		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	6.91	10.8	0.0313	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.957	0.833	0.6378	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.929	0.141	1.72		0	2.05	0.322	91.69%	0.00%
34122-009; 009		8	3.78	1.91	5.65		1.2	7.8	0.791	59.20%	-307.21%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	1.8	2.05	1.3	0.2	1.1	0	0.05	
34122-009; 009		2.9	3.4	1.8	7.8	5.15	2.35	1.2	5.65

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	15-1042-5341	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed reproduction	61.24%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-010; 010*	1.82	1.77	0.569	13	CDF	0.0456	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.88	2.55	0.7122	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.28076	1.28076	1	3.33	0.0912	Non-Significant Effect
Error	5.00429	0.384945	13			
Total	6.28505		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.75	9.16	0.0162	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.971	0.833	0.8706	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	0.929	0.141	1.72		0	2.05	0.322	91.69%	0.00%
34122-010; 010		8	0.343	0.0871	0.599		0	0.95	0.108	89.22%	63.08%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	1.8	2.05	1.3	0.2	1.1	0	0.05	
34122-010; 010		0.35	0.143	0.3	0.1	0.6	0.95	0.3	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-8230-6267	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 failed reproduction	53.23%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-006; 006*	2.54	1.89	0.709	7	CDF	0.0193	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.89	2.59	0.7359	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.61	3.61	1	6.45	0.0236	Significant Effect
Error	7.83437	0.559598	14			
Total	11.4444		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	15.2	8.89	0.0019	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.95	0.841	0.4961	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	1.33	0.475	2.19		0	2.7	0.362	76.97%	0.00%
34122-006; 006		8	0.381	0.161	0.601		0	0.7	0.093	69.02%	71.36%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.75	2.7	1.6	0.8	2.7	0.35	1.75	0
34122-006; 006		0.2	0.5	0.6	0.25	0.7	0.15	0.65	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	09-8435-2406	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed reproduction	77.72%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-007; 007	-0.966	1.76	1.03	14	CDF	0.8247	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.98	2.59	0.5622	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.28714	1.28714	1	0.932	0.3506	Non-Significant Effect
Error	19.3253	1.38038	14			
Total	20.6124		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.63	8.89	0.5350	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.97	0.841	0.8344	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	1.33	0.475	2.19		0	2.7	0.362	76.97%	0.00%
34122-007; 007		8	1.9	0.805	2.99		0	4.15	0.462	68.89%	-42.61%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.75	2.7	1.6	0.8	2.7	0.35	1.75	0
34122-007; 007		1.4	2.35	2.9	4.15	2.35	1.24	0	0.8

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	04-9171-9486	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed reproduction	51.15%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-008; 008*	2.75	1.76	0.681	14	CDF	0.0078	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.83	2.59	0.8765	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.51562	4.51562	1	7.55	0.0157	Significant Effect
Error	8.36938	0.597812	14			
Total	12.885		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.21	8.89	0.0184	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.953	0.841	0.5401	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	1.33	0.475	2.19		0	2.7	0.362	76.97%	0.00%
34122-008; 008		8	0.269	-0.0503	0.588		0	1.1	0.135	142.02%	79.81%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.75	2.7	1.6	0.8	2.7	0.35	1.75	0
34122-008; 008		0.15	1.1	0.2	0	0.55	0	0.15	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	18-7515-4379	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed reproduction	115.16%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-009; 009	-2.81	1.76	1.53	14	CDF	0.9931	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.39	2.59	0.1269	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	24.01	24.01	1	7.92	0.0138	Significant Effect
Error	42.4244	3.03031	14			
Total	66.4344		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	4.77	8.89	0.0563	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.953	0.841	0.5335	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	1.33	0.475	2.19		0	2.7	0.362	76.97%	0.00%
34122-009; 009		8	3.78	1.91	5.65		1.2	7.8	0.791	59.20%	-184.04%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.75	2.7	1.6	0.8	2.7	0.35	1.75	0
34122-009; 009		2.9	3.4	1.8	7.8	5.15	2.35	1.2	5.65

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	14-2251-4557	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed reproduction	52.81%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-010; 010*	2.61	1.86	0.703	8	CDF	0.0155	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.87	2.59	0.7802	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.90768	3.90768	1	6.83	0.0204	Significant Effect
Error	8.00469	0.571763	14			
Total	11.9124		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	11.2	8.89	0.0050	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.961	0.841	0.6799	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	1.33	0.475	2.19		0	2.7	0.362	76.97%	0.00%
34122-010; 010		8	0.343	0.0871	0.599		0	0.95	0.108	89.22%	74.25%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	0.75	2.7	1.6	0.8	2.7	0.35	1.75	0
34122-010; 010		0.35	0.143	0.3	0.1	0.6	0.95	0.3	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	09-0652-9174	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 failed reproduction	23.98%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-006; 006*	5.4	1.8	0.329	11	CDF	1.1E-04	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.02	2.46	0.3644	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.00808	3.00808	1	29.2	2.2E-04	Significant Effect
Error	1.13269	0.102972	11			
Total	4.14077		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.34	10.1	0.3078	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.904	0.814	0.1517	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	1.37	0.87	1.87		0.75	1.7	0.18	29.38%	0.00%
34122-006; 006		8	0.381	0.161	0.601		0	0.7	0.093	69.02%	72.17%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	1.2	1.5	1.7	1.7	0.75			
34122-006; 006		0.2	0.5	0.6	0.25	0.7	0.15	0.65	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	21-2698-7888	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed reproduction	80.06%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-007; 007	-0.865	1.8	1.1	11	CDF	0.7974	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.2	2.46	0.1843	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.859461	0.859461	1	0.749	0.4053	Non-Significant Effect
Error	12.6236	1.1476	11			
Total	13.4831		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	10.6	21.6	0.0381	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.966	0.814	0.8367	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	1.37	0.87	1.87		0.75	1.7	0.18	29.38%	0.00%
34122-007; 007		8	1.9	0.805	2.99		0	4.15	0.462	68.89%	-38.58%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	1.2	1.5	1.7	1.7	0.75			
34122-007; 007		1.4	2.35	2.9	4.15	2.35	1.24	0	0.8

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	08-2974-2154	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed reproduction	29.10%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-008; 008*	4.96	1.8	0.399	11	CDF	2.1E-04	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.23	2.46	0.1590	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.73154	3.73154	1	24.6	4.3E-04	Significant Effect
Error	1.66769	0.151608	11			
Total	5.39923		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.11	10.1	0.8437	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.938	0.814	0.4311	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	1.37	0.87	1.87		0.75	1.7	0.18	29.38%	0.00%
34122-008; 008		8	0.269	-0.0503	0.588		0	1.1	0.135	142.02%	80.38%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	1.2	1.5	1.7	1.7	0.75			
34122-008; 008		0.15	1.1	0.2	0	0.55	0	0.15	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	02-1947-8975	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed reproduction	112.24%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-009; 009	-2.97	1.89	1.54	7	CDF	0.9896	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.33	2.46	0.1006	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	17.8896	17.8896	1	5.51	0.0387	Significant Effect
Error	35.7227	3.24752	11			
Total	53.6123		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	30.9	21.6	0.0050	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.952	0.814	0.6237	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	1.37	0.87	1.87		0.75	1.7	0.18	29.38%	0.00%
34122-009; 009		8	3.78	1.91	5.65		1.2	7.8	0.791	59.20%	-176.00%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	1.2	1.5	1.7	1.7	0.75			
34122-009; 009		2.9	3.4	1.8	7.8	5.15	2.35	1.2	5.65

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	12-2190-7716	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed reproduction	25.72%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-010; 010*	5.23	1.8	0.352	11	CDF	1.4E-04	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.88	2.46	0.5729	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.24622	3.24622	1	27.4	2.8E-04	Significant Effect
Error	1.303	0.118455	11			
Total	4.54922		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.73	10.1	0.4936	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.985	0.814	0.9962	Normal Distribution

Reproduction Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	1.37	0.87	1.87		0.75	1.7	0.18	29.38%	0.00%
34122-010; 010		8	0.343	0.0871	0.599		0	0.95	0.108	89.22%	74.97%

Reproduction Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	1.2	1.5	1.7	1.7	0.75			
34122-010; 010		0.35	0.143	0.3	0.1	0.6	0.95	0.3	0

28 day *Leptocheirus plumulosus* Survival, Growth and Reproduction Sediment Evaluation

CETIS™ Summary, Ad Hoc Query and Analytical Reports

Offspring/Surviving Female Statistical Analysis

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h		
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d		
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d		
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d		
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h		
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
16-5566-9031	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0036	34122-001; 001 failed offspring/surviving fe	1
08-9735-8904	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0280	34122-002; 002 failed offspring/surviving fe	1
06-6201-6541	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0028	34122-003; 003 failed offspring/surviving fe	1
12-3181-1635	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0933	34122-004; 004 passed offspring/surviving	1
09-6581-8519	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.2518	34122-005; 005 passed offspring/surviving	1
01-2065-6964	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0833	34122-006; 006 passed offspring/surviving	1
14-5503-4611	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.1063	34122-006; 006 passed offspring/surviving	1
17-5504-1984	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0368	34122-006; 006 failed offspring/surviving fe	1
20-5260-5344	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.1846	34122-006; 006 passed offspring/surviving	1
05-2529-4013	Offspring/Surviving Female	Unequal Variance t Two-Sample Test	0.0434	34122-006; 006 failed offspring/surviving fe	1
09-2767-5592	Offspring/Surviving Female	Unequal Variance t Two-Sample Test	0.0460	34122-006; 006 failed offspring/surviving fe	1
19-8747-7150	Offspring/Surviving Female	Unequal Variance t Two-Sample Test	0.0142	34122-006; 006 failed offspring/surviving fe	1
21-2271-6841	Offspring/Surviving Female	Unequal Variance t Two-Sample Test	6.9E-04	34122-006; 006 failed offspring/surviving fe	1
00-0063-8517	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.4374	34122-007; 007 passed offspring/surviving	1
00-8925-0140	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.1686	34122-007; 007 passed offspring/surviving	1
02-7339-8380	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.9436	34122-007; 007 passed offspring/surviving	1
04-1350-9742	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.7937	34122-007; 007 passed offspring/surviving	1
06-9769-0535	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.9341	34122-007; 007 passed offspring/surviving	1
11-3081-4407	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.6053	34122-007; 007 passed offspring/surviving	1
02-7179-1601	Offspring/Surviving Female	Equal Variance t Two-Sample Test	1.4E-04	34122-008; 008 failed offspring/surviving fe	1
04-8274-5361	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0893	34122-008; 008 passed offspring/surviving	1
06-8044-9711	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0081	34122-008; 008 failed offspring/surviving fe	1
11-0147-2892	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.1556	34122-008; 008 passed offspring/surviving	1
11-9834-4196	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0356	34122-008; 008 failed offspring/surviving fe	1

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test **Enthalpy Analytical, LLC**

SIngle Comparison Summary

Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result	S
14-1383-2461	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0241	34122-008; 008 failed offspring/surviving fe	1
08-5087-6428	Offspring/Surviving Female	Unequal Variance t Two-Sample Test	0.0428	34122-008; 008 failed offspring/surviving fe	1
02-0483-2084	Offspring/Surviving Female	Wilcoxon Rank Sum Two-Sample Test	0.0499	34122-008; 008 failed offspring/surviving fe	1
00-1564-2254	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.9988	34122-009; 009 passed offspring/surviving	1
03-6627-9697	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.9986	34122-009; 009 passed offspring/surviving	1
05-4567-4658	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.9948	34122-009; 009 passed offspring/surviving	1
16-8590-4363	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.9461	34122-009; 009 passed offspring/surviving	1
19-9755-4746	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.9366	34122-009; 009 passed offspring/surviving	1
21-4067-2480	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.9893	34122-009; 009 passed offspring/surviving	1
03-6783-9318	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.2464	34122-010; 010 passed offspring/surviving	1
04-1942-8188	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.1320	34122-010; 010 passed offspring/surviving	1
07-4921-1210	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0112	34122-010; 010 failed offspring/surviving fe	1
08-2742-5456	Offspring/Surviving Female	Equal Variance t Two-Sample Test	2.0E-04	34122-010; 010 failed offspring/surviving fe	1
14-6712-0962	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0571	34122-010; 010 passed offspring/surviving	1
16-8265-9707	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.0339	34122-010; 010 failed offspring/surviving fe	1
20-2867-2701	Offspring/Surviving Female	Equal Variance t Two-Sample Test	0.1056	34122-010; 010 passed offspring/surviving	1
12-4302-1087	Offspring/Surviving Female	Unequal Variance t Two-Sample Test	0.0484	34122-010; 010 failed offspring/surviving fe	1

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
34122-000; 000	LC	8	4.95	2.99	6.92	0.857	7.36	0.831	2.35	47.47%	0.00%
34122-001; 001	R1	7	1.66	0.286	3.03	0.385	4.71	0.562	1.49	89.51%	66.49%
34122-002; 002	R2	7	2.5	0.502	4.49	0	6.71	0.815	2.16	86.37%	49.61%
34122-003; 003	R3	7	1.55	0.214	2.9	0	3.15	0.548	1.45	93.28%	68.61%
34122-004; 004	R4	8	3.26	1.16	5.36	0	7.71	0.889	2.51	77.02%	34.12%
34122-005; 005	R5	5	3.91	0.0607	7.76	1.07	8.5	1.39	3.1	79.29%	21.08%
34122-006; 006		8	0.802	0.22	1.38	0	1.86	0.246	0.696	86.78%	83.81%
34122-007; 007		8	3.63	1.19	6.08	0	9.22	1.03	2.93	80.49%	26.63%
34122-008; 008		8	0.674	-0.102	1.45	0	2.75	0.328	0.927	137.66%	86.40%
34122-009; 009		8	7.66	4.24	11.1	2.4	14.2	1.45	4.09	53.37%	-54.67%
34122-010; 010		8	0.833	0.0643	1.6	0	2.71	0.325	0.92	110.39%	83.18%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.857	5	7.36	2.9	6.25	3.46	6.43	7.36
34122-001; 001	R1		2	0.667	0.571	4.71	1.62	1.67	0.385
34122-002; 002	R2		3.27	6.71	1.67	0	2.9	1.1	1.82
34122-003; 003	R3	3		3.15	2.89	0.308	1.47	0	0.0667
34122-004; 004	R4	1.5	4.5	4	4	7.71	0.5	3.89	0
34122-005; 005	R5	2		2.31	5.67	8.5			1.07
34122-006; 006		0.286	0.833	1	0.417	1.75	0.273	1.86	0
34122-007; 007		2.55	3.62	5.8	9.22	4.7	1.86	0	1.33
34122-008; 008		0.273	2.75	0.667	0	1.1	0	0.6	0
34122-009; 009		8.29	8.5	2.4	14.2	10.3	3.92	3.43	10.3
34122-010; 010		0.412	0.176	0.5	0.4	1.71	2.71	0.75	0

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28-day Survival, Growth and Reproduction Sediment Evaluation
TASK: Statistical Analysis of Juveniles Produced per Surviving Female

Station	Method	C (H_0)	>	T (H_1)	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Sed-321-C120-0-0.5; 34122-001	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-001; 001	3.18325	1.77093	0.00359797	0.05	TRUE	1.832103	13		C
Sed-322-C120-0-0.5; 34122-002	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-002; 002	2.097728	1.77093	0.02802159	0.05	TRUE	2.074308	13		C
Sed-323-C120-0-0.5; 34122-003	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-003; 003	3.304703	1.77093	0.00284798	0.05	TRUE	1.82106	13		C
Sed-324-C120-0-0.5; 34122-004	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-004; 004	1.38905	1.76131	0.09325907	0.05	FALSE	2.143128	14		C
Sed-325-C120-0-0.5; 34122-005	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-005; 005	0.6915373	1.79589	0.251781	0.05	FALSE	2.710973	11		C
Sed-331-C120-0-0.5; 34122-006	Unequal Variance t Two-Sample Test	34122-000; 000	>	34122-006; 006	4.788173	1.85955	0.0006881	0.05	TRUE	1.61214	8		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-007; 007	0.9939516	1.76131	0.168558	0.05	FALSE	2.337081	14		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-008; 008	4.788783	1.76131	0.00014429	0.05	TRUE	1.573957	14		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-009; 009	-1.623758	1.76131	0.9366394	0.05	FALSE	2.93699	14		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-000; 000	>	34122-010; 010	4.615112	1.76131	0.00020039	0.05	TRUE	1.572247	14		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-006; 006	1.465382	1.77093	0.08329065	0.05	FALSE	1.036802	13		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-006; 006	0.9330765	1.78229	0.1845876	0.05	FALSE	0.666337	12		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-007; 007	-1.608256	1.77093	0.934108	0.05	FALSE	2.174034	13		C
Sed-335-C120-0-0.5; 34122-008	Wilcoxon Rank Sum Two-Sample Test	34122-001; 001	>	34122-008; 008	49.5		0.04988345	0.05	TRUE		13	1	E
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-008; 008	1.057136	1.78229	0.1556335	0.05	FALSE	0.804403	12		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-009; 009	-3.662946	1.77093	0.9985672	0.05	FALSE	2.901232	13		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-010; 010	1.315164	1.77093	0.1055904	0.05	FALSE	1.112941	13		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-001; 001	>	34122-010; 010	0.707457	1.78229	0.2463969	0.05	FALSE	0.79973	12		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-006; 006	1.960019	1.78229	0.03681502	0.05	TRUE	0.901121	12		C
Sed-331-C120-0-0.5; 34122-006	Unequal Variance t Two-Sample Test	34122-002; 002	>	34122-006; 006	1.990211	1.89458	0.04343209	0.05	TRUE	1.612631	7		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-007; 007	-0.846321	1.77093	0.793659	0.05	FALSE	2.381718	13		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-008; 008	2.180197	1.77093	0.02410891	0.05	TRUE	1.480225	13		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-008; 008	1.979962	1.78229	0.03555408	0.05	TRUE	1.007511	12		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-009; 009	-2.989051	1.77093	0.9947716	0.05	FALSE	3.059952	13		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-010; 010	1.703798	1.78229	0.05707595	0.05	FALSE	1.003784	12		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-002; 002	>	34122-010; 010	1.992015	1.77093	0.03390119	0.05	TRUE	1.478104	13		C
Sed-331-C120-0-0.5; 34122-006	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-006; 006	1.310795	1.77093	0.1063056	0.05	FALSE	1.017162	13		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-007; 007	-1.701096	1.77093	0.9436472	0.05	FALSE	2.164737	13		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-008; 008	1.421789	1.77093	0.08931663	0.05	FALSE	1.09753	13		C

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28-day Survival, Growth and Reproduction Sediment Evaluation
TASK: Statistical Analysis of Juveniles Produced per Surviving Female

Station	Method	C (H_0)	>	T (H_1)	Statistic	Critical	P Level	Alpha	Reject Null	MSD	DF	Ties	P-Type
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-009; 009	-3.736027	1.77093	0.9987535	0.05	FALSE	2.894272	13		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-003; 003	>	34122-010; 010	1.167185	1.77093	0.1320497	0.05	FALSE	1.094668	13		C
Sed-331-C120-0-0.5; 34122-006	Unequal Variance t Two-Sample Test	34122-004; 004	>	34122-006; 006	2.66921	1.85955	0.01419851	0.05	TRUE	1.71446	8		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-007; 007	-0.272313	1.76131	0.6053219	0.05	FALSE	2.401523	14		C
Sed-335-C120-0-0.5; 34122-008	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-008; 008	2.733832	1.76131	0.00807471	0.05	TRUE	1.668144	14		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-009; 009	-2.591873	1.76131	0.9893442	0.05	FALSE	2.988523	14		C
Sed-339-C120-0-0.5; 34122-010	Equal Variance t Two-Sample Test	34122-004; 004	>	34122-010; 010	2.56772	1.76131	0.01116797	0.05	TRUE	1.666531	14		C
Sed-331-C120-0-0.5; 34122-006	Unequal Variance t Two-Sample Test	34122-005; 005	>	34122-006; 006	2.207142	2.13185	0.04595908	0.05	TRUE	3.001209	4		C
Sed-333-C120-0-0.5; 34122-007	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-007; 007	0.1613249	1.79589	0.4373812	0.05	FALSE	3.060941	11		C
Sed-335-C120-0-0.5; 34122-008	Unequal Variance t Two-Sample Test	34122-005; 005	>	34122-008; 008	2.271503	2.13185	0.04279274	0.05	TRUE	3.03656	4		C
Sed-337-C120-0-0.5; 34122-009	Equal Variance t Two-Sample Test	34122-005; 005	>	34122-009; 009	-1.750583	1.79589	0.9460908	0.05	FALSE	3.848612	11		C
Sed-339-C120-0-0.5; 34122-010	Unequal Variance t Two-Sample Test	34122-005; 005	>	34122-010; 010	2.160323	2.13185	0.04842699	0.05	TRUE	3.035262	4		C

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	16-5566-9031	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:35	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-001; 001 failed offspring/surviving femal	36.99%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 1*	3.18	1.77	1.83	13	CDF	0.0036	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.13	2.55	0.3161	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	40.4887	40.4887	1	10.1	0.0072	Significant Effect
Error	51.944	3.99569	13			
Total	92.4326		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.5	10.8	0.2836	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.968	0.833	0.8332	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	4.95	2.99	6.92		0.857	7.36	0.831	47.47%	0.00%
34122-001; 001	R1	7	1.66	0.286	3.03		0.385	4.71	0.562	89.51%	66.49%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.857	5	7.36	2.9	6.25	3.46	6.43	7.36
34122-001; 001	R1	2	0.667	0.571	4.71	1.62	1.67	0.385	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	08-9735-8904	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:35	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-002; 002 failed offspring/surviving femal	41.88%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 2*	2.1	1.77	2.07	13	CDF	0.0280	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.93	2.55	0.5976	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	22.5391	22.5391	1	4.4	0.0560	Non-Significant Effect
Error	66.5859	5.12199	13			
Total	89.125		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.19	10.8	0.8484	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.992	0.833	0.9999	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	4.95	2.99	6.92		0.857	7.36	0.831	47.47%	0.00%
34122-002; 002	R2	7	2.5	0.502	4.49		0	6.71	0.815	86.37%	49.61%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.857	5	7.36	2.9	6.25	3.46	6.43	7.36
34122-002; 002	R2	3.27	6.71	1.67	0	2.9	1.1	1.82	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	06-6201-6541	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-003; 003 failed offspring/surviving femal	36.77%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 3*	3.3	1.77	1.82	13	CDF	0.0028	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.14	2.55	0.3018	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	43.1127	43.1127	1	10.9	0.0057	Significant Effect
Error	51.3197	3.94767	13			
Total	94.4324		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.63	10.8	0.2596	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.916	0.833	0.1663	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	4.95	2.99	6.92		0.857	7.36	0.831	47.47%	0.00%
34122-003; 003	R3	7	1.55	0.214	2.9		0	3.15	0.548	93.28%	68.61%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.857	5	7.36	2.9	6.25	3.46	6.43	7.36
34122-003; 003	R3	3	3.15	2.89	0.308	1.47	0	0.0667	

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	12-3181-1635	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-004; 004 passed offspring/surviving fe	43.27%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 4	1.39	1.76	2.14	14	CDF	0.0933	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.89	2.59	0.7372	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	11.4267	11.4267	1	1.93	0.1865	Non-Significant Effect
Error	82.9111	5.92222	14			
Total	94.3378		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.14	8.89	0.8651	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.963	0.841	0.7207	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	4.95	2.99	6.92		0.857	7.36	0.831	47.47%	0.00%
34122-004; 004	R4	8	3.26	1.16	5.36		0	7.71	0.889	77.02%	34.12%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.857	5	7.36	2.9	6.25	3.46	6.43	7.36
34122-004; 004	R4	1.5	4.5	4	4	7.71	0.5	3.89	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	09-6581-8519	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:36	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-005; 005 passed offspring/surviving fe	54.73%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		Reference Site 5	0.692	1.8	2.71	11	CDF	0.2518	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.81	2.46	0.7095	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.35306	3.35306	1	0.478	0.5036	Non-Significant Effect
Error	77.1263	7.01148	11			
Total	80.4794		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.74	10.1	0.4911	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.957	0.814	0.7074	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	4.95	2.99	6.92		0.857	7.36	0.831	47.47%	0.00%
34122-005; 005	R5	5	3.91	0.0607	7.76		1.07	8.5	1.39	79.29%	21.08%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.857	5	7.36	2.9	6.25	3.46	6.43	7.36
34122-005; 005	R5	2	2.31	5.67	8.5	1.07			

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	21-2271-6841	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 failed offspring/surviving femal	32.55%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-006; 006*	4.79	1.86	1.61	8	CDF	6.9E-04	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.45	2.59	0.0991	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	68.9271	68.9271	1	22.9	2.9E-04	Significant Effect
Error	42.09	3.00643	14			
Total	111.017		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	11.4	8.89	0.0047	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.95	0.841	0.4973	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	4.95	2.99	6.92		0.857	7.36	0.831	47.47%	0.00%
34122-006; 006		8	0.802	0.22	1.38		0	1.86	0.246	86.78%	83.81%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.857	5	7.36	2.9	6.25	3.46	6.43	7.36
34122-006; 006		0.286	0.833	1	0.417	1.75	0.273	1.86	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-8925-0140	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed offspring/surviving fe	47.18%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-007; 007	0.994	1.76	2.34	14	CDF	0.1686	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.18	2.59	0.2914	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.95771	6.95771	1	0.988	0.3371	Non-Significant Effect
Error	98.597	7.04265	14			
Total	105.555		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.55	8.89	0.5785	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.968	0.841	0.8115	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	4.95	2.99	6.92		0.857	7.36	0.831	47.47%	0.00%
34122-007; 007		8	3.63	1.19	6.08		0	9.22	1.03	80.49%	26.63%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.857	5	7.36	2.9	6.25	3.46	6.43	7.36
34122-007; 007		2.55	3.62	5.8	9.22	4.7	1.86	0	1.33

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	02-7179-1601	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed offspring/surviving femal	31.78%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-008; 008*	4.79	1.76	1.57	14	CDF	1.4E-04	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.37	2.59	0.1367	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	73.2528	73.2528	1	22.9	2.9E-04	Significant Effect
Error	44.72	3.19429	14			
Total	117.973		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	6.43	8.89	0.0253	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.944	0.841	0.4036	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	4.95	2.99	6.92		0.857	7.36	0.831	47.47%	0.00%
34122-008; 008		8	0.674	-0.102	1.45		0	2.75	0.328	137.66%	86.40%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.857	5	7.36	2.9	6.25	3.46	6.43	7.36
34122-008; 008		0.273	2.75	0.667	0	1.1	0	0.6	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	19-9755-4746	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed offspring/surviving fe	59.30%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-009; 009	-1.62	1.76	2.94	14	CDF	0.9366	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.02	2.59	0.4949	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	29.3249	29.3249	1	2.64	0.1267	Non-Significant Effect
Error	155.712	11.1223	14			
Total	185.037		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.02	8.89	0.1676	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.944	0.841	0.4012	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	4.95	2.99	6.92		0.857	7.36	0.831	47.47%	0.00%
34122-009; 009		8	7.66	4.24	11.1		2.4	14.2	1.45	53.37%	-54.67%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.857	5	7.36	2.9	6.25	3.46	6.43	7.36
34122-009; 009		8.29	8.5	2.4	14.2	10.3	3.92	3.43	10.3

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	08-2742-5456	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-000; 000	03-7377-9388	02 Jun-20 10:00	02 Jun-20 10:00	15d 2h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-000; 000	Laboratory Control Sediment	Blue Beach Site, Quonset, RI	Laboratory Control; 34122-0	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed offspring/surviving femal	31.74%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Lab Control Sedime		34122-010; 010*	4.62	1.76	1.57	14	CDF	2.0E-04	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.37	2.59	0.1352	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	67.8882	67.8882	1	21.3	4.0E-04	Significant Effect
Error	44.6229	3.18735	14			
Total	112.511		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	6.53	8.89	0.0242	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.948	0.841	0.4578	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-000; 000	LC	8	4.95	2.99	6.92		0.857	7.36	0.831	47.47%	0.00%
34122-010; 010		8	0.833	0.0643	1.6		0	2.71	0.325	110.39%	83.18%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-000; 000	LC	0.857	5	7.36	2.9	6.25	3.46	6.43	7.36
34122-010; 010		0.412	0.176	0.5	0.4	1.71	2.71	0.75	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	01-2065-6964	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed offspring/surviving fe	62.46%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-006; 006	1.47	1.77	1.04	13	CDF	0.0833	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.8	2.55	0.0103	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.74781	2.74781	1	2.15	0.1666	Non-Significant Effect
Error	16.6352	1.27963	13			
Total	19.383		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	4.56	9.16	0.0671	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.868	0.833	0.0319	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	1.66	0.286	3.03		0.385	4.71	0.562	89.51%	0.00%
34122-006; 006		8	0.802	0.22	1.38		0	1.86	0.246	86.78%	51.69%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	2	0.667	0.571	4.71	1.62	1.67	0.385	
34122-006; 006		0.286	0.833	1	0.417	1.75	0.273	1.86	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	06-9769-0535	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:37	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed offspring/surviving fe	130.98%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-007; 007	-1.61	1.77	2.17	13	CDF	0.9341	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.44	2.55	0.0845	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	14.5524	14.5524	1	2.59	0.1318	Non-Significant Effect
Error	73.1423	5.62633	13			
Total	87.6947		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.88	10.8	0.1194	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.936	0.833	0.3376	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	1.66	0.286	3.03		0.385	4.71	0.562	89.51%	0.00%
34122-007; 007		8	3.63	1.19	6.08		0	9.22	1.03	80.49%	-118.95%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	2	0.667	0.571	4.71	1.62	1.67	0.385	
34122-007; 007		2.55	3.62	5.8	9.22	4.7	1.86	0	1.33

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	02-0483-2084	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Nonparametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed offspring/surviving femal	67.22%

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-008; 008*	49.5	n/a	1	13	Exact	0.0499	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.6	2.55	0.0368	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.63093	3.63093	1	2.45	0.1415	Non-Significant Effect
Error	19.2652	1.48194	13			
Total	22.8962		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.57	9.16	0.2432	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.825	0.833	0.0079	Non-Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	1.66	0.286	3.03		0.385	4.71	0.562	89.51%	0.00%
34122-008; 008		8	0.674	-0.102	1.45		0	2.75	0.328	137.66%	59.41%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	2	0.667	0.571	4.71	1.62	1.67	0.385	
34122-008; 008		0.273	2.75	0.667	0	1.1	0	0.6	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-0147-2892	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 passed offspring/surviving fe	69.90%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-008; 008	1.06	1.78	0.804	12	CDF	0.1556	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.78049	0.78049	1	1.12	0.3113	Non-Significant Effect
Error	8.38082	0.698402	12			
Total	9.16131		13			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.82	14.2	0.5272	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.846	0.824	0.0197	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	6	1.15	0.43	1.87		0.385	2	0.28	59.70%	0.00%
34122-008; 008		8	0.674	-0.102	1.45		0	2.75	0.328	137.66%	41.46%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	2	0.667	0.571	Outlier	1.62	1.67	0.385	
34122-008; 008		0.273	2.75	0.667	0	1.1	0	0.6	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	03-6627-9697	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed offspring/surviving fe	174.79%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-009; 009	-3.66	1.77	2.9	13	CDF	0.9986	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.14	2.55	0.3033	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	134.437	134.437	1	13.4	0.0029	Significant Effect
Error	130.257	10.0198	13			
Total	264.694		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.57	10.8	0.0249	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.966	0.833	0.7986	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	1.66	0.286	3.03		0.385	4.71	0.562	89.51%	0.00%
34122-009; 009		8	7.66	4.24	11.1		2.4	14.2	1.45	53.37%	-361.53%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	2	0.667	0.571	4.71	1.62	1.67	0.385	
34122-009; 009		8.29	8.5	2.4	14.2	10.3	3.92	3.43	10.3

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	20-2867-2701	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-001; 001	18-4193-7980	28 May-20 11:55	29 May-20 10:50	20d 0h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-001; 001	Reference sediment	Blue Beach Site, Quonset, RI	Sed-321-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 passed offspring/surviving fe	67.05%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 1		34122-010; 010	1.32	1.77	1.11	13	CDF	0.1056	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.61	2.55	0.0355	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.55033	2.55033	1	1.73	0.2112	Non-Significant Effect
Error	19.1681	1.47447	13			
Total	21.7185		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.61	9.16	0.2355	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.851	0.833	0.0178	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-001; 001	R1	7	1.66	0.286	3.03		0.385	4.71	0.562	89.51%	0.00%
34122-010; 010		8	0.833	0.0643	1.6		0	2.71	0.325	110.39%	49.79%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-001; 001	R1	2	0.667	0.571	4.71	1.62	1.67	0.385	
34122-010; 010		0.412	0.176	0.5	0.4	1.71	2.71	0.75	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	17-5504-1984	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 failed offspring/surviving femal	50.26%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-006; 006*	1.96	1.78	0.901	12	CDF	0.0368	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.36701	3.36701	1	3.84	0.0736	Non-Significant Effect
Error	10.5173	0.876443	12			
Total	13.8843		13			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.94	9.52	0.1919	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.956	0.824	0.6523	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	6	1.79	0.54	3.05		0	3.27	0.487	66.59%	0.00%
34122-006; 006		8	0.802	0.22	1.38		0	1.86	0.246	86.78%	55.27%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	3.27	Outlier	1.67	0	2.9	1.1	1.82	
34122-006; 006		0.286	0.833	1	0.417	1.75	0.273	1.86	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	04-1350-9742	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed offspring/surviving fe	95.42%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-007; 007	-0.846	1.77	2.38	13	CDF	0.7937	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.23	2.55	0.2131	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.83663	4.83663	1	0.716	0.4127	Non-Significant Effect
Error	87.7842	6.75263	13			
Total	92.6208		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.84	10.8	0.4746	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.939	0.833	0.3683	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	2.5	0.502	4.49		0	6.71	0.815	86.37%	0.00%
34122-007; 007		8	3.63	1.19	6.08		0	9.22	1.03	80.49%	-45.60%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	3.27	6.71	1.67	0	2.9	1.1	1.82	
34122-007; 007		2.55	3.62	5.8	9.22	4.7	1.86	0	1.33

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	14-1383-2461	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed offspring/surviving femal	59.30%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-008; 008*	2.18	1.77	1.48	13	CDF	0.0241	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.71	2.55	0.0193	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	12.3976	12.3976	1	4.75	0.0482	Significant Effect
Error	33.9071	2.60824	13			
Total	46.3048		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.4	9.16	0.0434	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.874	0.833	0.0391	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	2.5	0.502	4.49		0	6.71	0.815	86.37%	0.00%
34122-008; 008		8	0.674	-0.102	1.45		0	2.75	0.328	137.66%	73.01%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	3.27	6.71	1.67	0	2.9	1.1	1.82	
34122-008; 008		0.273	2.75	0.667	0	1.1	0	0.6	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	05-4567-4658	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed offspring/surviving fe	122.60%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-009; 009	-2.99	1.77	3.06	13	CDF	0.9948	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.03	2.55	0.4449	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	99.5837	99.5837	1	8.93	0.0105	Significant Effect
Error	144.899	11.1461	13			
Total	244.482		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	3.6	10.8	0.1399	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.98	0.833	0.9662	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	2.5	0.502	4.49		0	6.71	0.815	86.37%	0.00%
34122-009; 009		8	7.66	4.24	11.1		2.4	14.2	1.45	53.37%	-206.92%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	3.27	6.71	1.67	0	2.9	1.1	1.82	
34122-009; 009		8.29	8.5	2.4	14.2	10.3	3.92	3.43	10.3

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	16-8265-9707	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed offspring/surviving femal	59.22%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-010; 010*	1.99	1.77	1.48	13	CDF	0.0339	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.71	2.55	0.0188	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	10.3202	10.3202	1	3.97	0.0678	Non-Significant Effect
Error	33.81	2.60077	13			
Total	44.1302		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	5.49	9.16	0.0416	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.886	0.833	0.0576	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	7	2.5	0.502	4.49		0	6.71	0.815	86.37%	0.00%
34122-010; 010		8	0.833	0.0643	1.6		0	2.71	0.325	110.39%	66.61%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	3.27	6.71	1.67	0	2.9	1.1	1.82	
34122-010; 010		0.412	0.176	0.5	0.4	1.71	2.71	0.75	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	14-6712-0962	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:38	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-002; 002	21-3995-5767	28 May-20 12:05	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-002; 002	Reference sediment	Blue Beach Site, Quonset, RI	Sed-322-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 passed offspring/surviving fe	55.99%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 2		34122-010; 010	1.7	1.78	1	12	CDF	0.0571	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.157	3.157	1	2.9	0.1142	Non-Significant Effect
Error	13.0503	1.08752	12			
Total	16.2073		13			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.68	9.52	0.5118	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.94	0.824	0.4201	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-002; 002	R2	6	1.79	0.54	3.05		0	3.27	0.487	66.59%	0.00%
34122-010; 010		8	0.833	0.0643	1.6		0	2.71	0.325	110.39%	53.52%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-002; 002	R2	3.27	Outlier	1.67	0	2.9	1.1	1.82	
34122-010; 010		0.412	0.176	0.5	0.4	1.71	2.71	0.75	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	14-5503-4611	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 passed offspring/surviving fe	65.42%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-006; 006	1.31	1.77	1.02	13	CDF	0.1063	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.5	2.55	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.11613	2.11613	1	1.72	0.2126	Non-Significant Effect
Error	16.0109	1.23161	13			
Total	18.127		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	4.34	9.16	0.0756	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.934	0.833	0.3157	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	1.55	0.214	2.9		0	3.15	0.548	93.28%	0.00%
34122-006; 006		8	0.802	0.22	1.38		0	1.86	0.246	86.78%	48.42%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	3	3.15	2.89	0.308	1.47	0	0.0667	
34122-006; 006		0.286	0.833	1	0.417	1.75	0.273	1.86	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	02-7339-8380	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed offspring/surviving fe	139.23%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-007; 007	-1.7	1.77	2.16	13	CDF	0.9436	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.46	2.55	0.0803	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	16.1421	16.1421	1	2.89	0.1127	Non-Significant Effect
Error	72.518	5.57831	13			
Total	88.6601		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	4.07	10.8	0.1076	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.942	0.833	0.4056	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	1.55	0.214	2.9		0	3.15	0.548	93.28%	0.00%
34122-007; 007		8	3.63	1.19	6.08		0	9.22	1.03	80.49%	-133.74%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	3	3.15	2.89	0.308	1.47	0	0.0667	
34122-007; 007		2.55	3.62	5.8	9.22	4.7	1.86	0	1.33

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	04-8274-5361	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 passed offspring/surviving fe	70.59%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-008; 008	1.42	1.77	1.1	13	CDF	0.0893	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.8	2.55	0.8849	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.89865	2.89865	1	2.02	0.1786	Non-Significant Effect
Error	18.641	1.43392	13			
Total	21.5396		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.45	9.16	0.2673	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.929	0.833	0.2621	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	1.55	0.214	2.9		0	3.15	0.548	93.28%	0.00%
34122-008; 008		8	0.674	-0.102	1.45		0	2.75	0.328	137.66%	56.67%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	3	3.15	2.89	0.308	1.47	0	0.0667	
34122-008; 008		0.273	2.75	0.667	0	1.1	0	0.6	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-1564-2254	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed offspring/surviving fe	186.15%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-009; 009	-3.74	1.77	2.89	13	CDF	0.9988	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.14	2.55	0.2977	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	139.185	139.185	1	14	0.0025	Significant Effect
Error	129.633	9.97174	13			
Total	268.817		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.95	10.8	0.0221	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.964	0.833	0.7691	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	1.55	0.214	2.9		0	3.15	0.548	93.28%	0.00%
34122-009; 009		8	7.66	4.24	11.1		2.4	14.2	1.45	53.37%	-392.70%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	3	3.15	2.89	0.308	1.47	0	0.0667	
34122-009; 009		8.29	8.5	2.4	14.2	10.3	3.92	3.43	10.3

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	04-1942-8188	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-003; 003	15-7879-7046	28 May-20 12:15	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-003; 003	Reference sediment	Blue Beach Site, Quonset, RI	Sed-323-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 passed offspring/surviving fe	70.40%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 3		34122-010; 010	1.17	1.77	1.09	13	CDF	0.1320	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.63	2.55	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.94328	1.94328	1	1.36	0.2641	Non-Significant Effect
Error	18.5439	1.42645	13			
Total	20.4871		14			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.49	9.16	0.2590	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.916	0.833	0.1692	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-003; 003	R3	7	1.55	0.214	2.9		0	3.15	0.548	93.28%	0.00%
34122-010; 010		8	0.833	0.0643	1.6		0	2.71	0.325	110.39%	46.40%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-003; 003	R3	3	3.15	2.89	0.308	1.47	0	0.0667	
34122-010; 010		0.412	0.176	0.5	0.4	1.71	2.71	0.75	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	19-8747-7150	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 failed offspring/surviving femal	52.54%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-006; 006*	2.67	1.86	1.71	8	CDF	0.0142	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.5	2.59	0.0772	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	24.2251	24.2251	1	7.12	0.0183	Significant Effect
Error	47.6023	3.40016	14			
Total	71.8274		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	13	8.89	0.0031	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.926	0.841	0.2098	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	3.26	1.16	5.36		0	7.71	0.889	77.02%	0.00%
34122-006; 006		8	0.802	0.22	1.38		0	1.86	0.246	86.78%	75.42%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1.5	4.5	4	4	7.71	0.5	3.89	0
34122-006; 006		0.286	0.833	1	0.417	1.75	0.273	1.86	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	11-3081-4407	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed offspring/surviving fe	73.60%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-007; 007	-0.272	1.76	2.4	14	CDF	0.6053	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.12	2.59	0.3583	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.551441	0.551441	1	0.0742	0.7894	Non-Significant Effect
Error	104.109	7.43638	14			
Total	104.661		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.35	8.89	0.6988	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.944	0.841	0.4019	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	3.26	1.16	5.36		0	7.71	0.889	77.02%	0.00%
34122-007; 007		8	3.63	1.19	6.08		0	9.22	1.03	80.49%	-11.38%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1.5	4.5	4	4	7.71	0.5	3.89	0
34122-007; 007		2.55	3.62	5.8	9.22	4.7	1.86	0	1.33

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	06-8044-9711	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:39	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed offspring/surviving femal	51.12%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-008; 008*	2.73	1.76	1.67	14	CDF	0.0081	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.43	2.59	0.1050	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	26.8163	26.8163	1	7.47	0.0161	Significant Effect
Error	50.2323	3.58802	14			
Total	77.0486		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.34	8.89	0.0174	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.95	0.841	0.4898	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	3.26	1.16	5.36		0	7.71	0.889	77.02%	0.00%
34122-008; 008		8	0.674	-0.102	1.45		0	2.75	0.328	137.66%	79.35%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1.5	4.5	4	4	7.71	0.5	3.89	0
34122-008; 008		0.273	2.75	0.667	0	1.1	0	0.6	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	21-4067-2480	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed offspring/surviving fe	91.59%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-009; 009	-2.59	1.76	2.99	14	CDF	0.9893	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.99	2.59	0.5527	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	77.3622	77.3622	1	6.72	0.0213	Significant Effect
Error	161.224	11.516	14			
Total	238.586		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	2.65	8.89	0.2224	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.956	0.841	0.5817	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	3.26	1.16	5.36		0	7.71	0.889	77.02%	0.00%
34122-009; 009		8	7.66	4.24	11.1		2.4	14.2	1.45	53.37%	-134.78%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1.5	4.5	4	4	7.71	0.5	3.89	0
34122-009; 009		8.29	8.5	2.4	14.2	10.3	3.92	3.43	10.3

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	07-4921-1210	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-004; 004	01-0560-6923	28 May-20 12:25	29 May-20 10:50	20d	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-004; 004	Reference sediment	Blue Beach Site, Quonset, RI	Sed-324-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed offspring/surviving femal	51.08%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 4		34122-010; 010*	2.57	1.76	1.67	14	CDF	0.0112	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.43	2.59	0.1039	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	23.6108	23.6108	1	6.59	0.0223	Significant Effect
Error	50.1352	3.58109	14			
Total	73.746		15			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	7.46	8.89	0.0166	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.951	0.841	0.5003	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-004; 004	R4	8	3.26	1.16	5.36		0	7.71	0.889	77.02%	0.00%
34122-010; 010		8	0.833	0.0643	1.6		0	2.71	0.325	110.39%	74.46%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-004; 004	R4	1.5	4.5	4	4	7.71	0.5	3.89	0
34122-010; 010		0.412	0.176	0.5	0.4	1.71	2.71	0.75	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	09-2767-5592	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-006; 006	13-3638-9228	28 May-20 11:00	29 May-20 10:50	20d 1h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-006; 006	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-331-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-006; 006 failed offspring/surviving femal	76.77%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-006; 006*	2.21	2.13	3	4	CDF	0.0460	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.46	2.46	0.0508	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	29.7069	29.7069	1	7.81	0.0174	Significant Effect
Error	41.8175	3.80159	11			
Total	71.5245		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	19.8	10.1	0.0013	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.934	0.814	0.3805	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	3.91	0.0607	7.76		1.07	8.5	1.39	79.29%	0.00%
34122-006; 006		8	0.802	0.22	1.38		0	1.86	0.246	86.78%	79.49%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	2	2.31	5.67	8.5	1.07			
34122-006; 006		0.286	0.833	1	0.417	1.75	0.273	1.86	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	00-0063-8517	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-007; 007	09-4748-8209	28 May-20 10:25	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-007; 007	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-333-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-007; 007 passed offspring/surviving fe	78.30%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-007; 007	0.161	1.8	3.06	11	CDF	0.4374	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.95	2.46	0.4564	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.232634	0.232634	1	0.026	0.8748	Non-Significant Effect
Error	98.3246	8.9386	11			
Total	98.5572		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.12	10.1	0.8356	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.92	0.814	0.2545	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	3.91	0.0607	7.76		1.07	8.5	1.39	79.29%	0.00%
34122-007; 007		8	3.63	1.19	6.08		0	9.22	1.03	80.49%	7.03%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	2	2.31	5.67	8.5	1.07			
34122-007; 007		2.55	3.62	5.8	9.22	4.7	1.86	0	1.33

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	08-5087-6428	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-008; 008	12-7891-0816	28 May-20 10:10	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-008; 008	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-335-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-008; 008 failed offspring/surviving femal	77.68%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-008; 008*	2.27	2.13	3.04	4	CDF	0.0428	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.39	2.46	0.0759	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	32.2103	32.2103	1	7.97	0.0166	Significant Effect
Error	44.4476	4.04069	11			
Total	76.6579		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	11.2	10.1	0.0074	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.924	0.814	0.2846	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	3.91	0.0607	7.76		1.07	8.5	1.39	79.29%	0.00%
34122-008; 008		8	0.674	-0.102	1.45		0	2.75	0.328	137.66%	82.77%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	2	2.31	5.67	8.5	1.07			
34122-008; 008		0.273	2.75	0.667	0	1.1	0	0.6	0

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	16-8590-4363	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-009; 009	09-8651-8659	28 May-20 09:55	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-009; 009	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-337-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-009; 009 passed offspring/surviving fe	98.45%

Equal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-009; 009	-1.75	1.8	3.85	11	CDF	0.9461	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	1.81	2.46	0.7073	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	43.3045	43.3045	1	3.06	0.1078	Non-Significant Effect
Error	155.439	14.1308	11			
Total	198.744		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	1.74	21.6	0.6192	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.966	0.814	0.8388	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	3.91	0.0607	7.76		1.07	8.5	1.39	79.29%	0.00%
34122-009; 009		8	7.66	4.24	11.1		2.4	14.2	1.45	53.37%	-95.97%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	2	2.31	5.67	8.5	1.07			
34122-009; 009		8.29	8.5	2.4	14.2	10.3	3.92	3.43	10.3

Leptocheirus 28-d Survival, Growth and Reproduction Sediment Test — **Enthalpy Analytical, LLC**

Analysis ID:	12-4302-1087	**Endpoint:**	Offspring/Surviving Female	**CETIS Version:**	CETISv1.9.6
Analyzed:	21 Jul-20 15:40	**Analysis:**	Parametric-Two Sample	**Status Level:**	1
Batch ID:	19-1063-3482	**Test Type:**	Leptocheirus (28-d)	**Analyst:**	Renee McIsaac
Start Date:	17 Jun-20 12:00	**Protocol:**	EPA/600/R-01/020 (2001)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-20 12:00	**Species:**	Leptocheirus plumulosus	**Brine:**	Not Applicable
Test Length:	28d 0h	**Taxon:**	Malacostraca	**Source:**	ABS - Aquatic Biosystems, **Age:**

Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project
34122-005; 005	12-4589-8756	28 May-20 12:35	29 May-20 10:50	19d 23h	Mabbett & Associates	Ecological Risk Assessm
34122-010; 010	17-9586-3657	28 May-20 09:40	29 May-20 10:50	20d 2h		

Sample Code	Material Type	Sample Source	Station Location	Lat/Long
34122-005; 005	Reference sediment	Blue Beach Site, Quonset, RI	Sed-325-C120-0-0.5; 34122	
34122-010; 010	Estuarine Sediment Sample	Blue Beach Site, Quonset, RI	Sed-339-C120-0-0.5; 34122	

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	34122-010; 010 failed offspring/surviving femal	77.64%

Unequal Variance t Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Reference Site 5		34122-010; 010*	2.16	2.13	3.04	4	CDF	0.0484	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Outlier	Grubbs Extreme Value Test	2.39	2.46	0.0749	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	29.1095	29.1095	1	7.22	0.0211	Significant Effect
Error	44.3505	4.03186	11			
Total	73.46		12			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Variance Ratio F Test	11.4	10.1	0.0070	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.927	0.814	0.3102	Normal Distribution

Offspring/Surviving Female Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
34122-005; 005	R5	5	3.91	0.0607	7.76		1.07	8.5	1.39	79.29%	0.00%
34122-010; 010		8	0.833	0.0643	1.6		0	2.71	0.325	110.39%	78.68%

Offspring/Surviving Female Detail

Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
34122-005; 005	R5	2	2.31	5.67	8.5	1.07			
34122-010; 010		0.412	0.176	0.5	0.4	1.71	2.71	0.75	0

28 day *Leptocheirus plumulosus* Survival, Growth and Reproduction Sediment Evaluation

Water Quality Data

Sample Reading Order for Water Quality Measurements

Study: 34122
Client: Mabbett & Associates
Project: Blue Beach FUDS Site

Reading Number	Field ID	Lab Code	Sample Number
1	Laboratory Control	34122-000	000
2	SED-321-CI20-0-0.5	34122-001	001
3	SED-322-CI20-0-0.5	34122-002	002
4	SED-323-CI20-0-0.5	34122-003	003
5	SED-324-CI20-0-0.5	34122-004	004
6	SED-325-CI20-0-0.5	34122-005	005
7	SED-331-CI20-0-0.5	34122-006	006
8	SED-333-CI20-0-0.5	34122-007	007
9	SED-335-CI20-0-0.5	34122-008	008
10	SED-337-CI20-0-0.5	34122-009	009
11	SED-339-CI20-0-0.5	34122-010	0010

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	24.8	6.69	90.7		32763	20.47
Minimum:	20.0	4.01	54.6	6.71	28904	17.82
Maximum:	26.1	7.74	97.4	7.87	34939	21.97

Field ID	Replicate	Day	DateTime M/D/Y	Temp °C	DO mg/L	DO % Sat	pH SU	SpCond µS/cm	Salinity ppt
Laboratory Control	Surrogate	00	6/17/2020 10:37:47	25.5	7.06	95.9	7.76	33040	20.64
Sed-321-C120-0-0.5	Surrogate	00	6/17/2020 10:38:10	25.5	6.63	90.0	7.53	33033	20.64
Sed-322-C120-0-0.5	Surrogate	00	6/17/2020 10:38:32	25.5	6.84	92.7	7.43	32755	20.45
Sed-323-C120-0-0.5	Surrogate	00	6/17/2020 10:38:52	25.5	6.66	90.6	7.33	33411	20.90
Sed-324-C120-0-0.5	Surrogate	00	6/17/2020 10:39:19	25.6	6.36	86.5	7.32	33084	20.67
Sed-325-C120-0-0.5	Surrogate	00	6/17/2020 10:39:41	25.6	6.64	90.3	7.41	33279	20.81
Sed-331-C120-0-0.5	Surrogate	00	6/17/2020 10:40:04	25.5	6.75	91.4	7.46	32569	20.32
Sed-333-C120-0-0.5	Surrogate	00	6/17/2020 10:40:19	25.4	6.75	91.5	7.53	33146	20.72
Sed-335-C120-0-0.5	Surrogate	00	6/17/2020 10:40:46	25.5	6.64	90.0	7.75	32886	20.54
Sed-337-C120-0-0.5	Surrogate	00	6/17/2020 10:41:07	25.5	6.74	91.3	7.85	32787	20.47
Sed-339-C120-0-0.5	Surrogate	00	6/17/2020 10:41:26	25.5	7.01	95.1	7.87	32815	20.49
Laboratory Control	Surrogate	01	6/18/2020 09:54:06	25.0	6.97	94.2	7.13	33518	20.98
Sed-321-C120-0-0.5	Surrogate	01	6/18/2020 09:54:33	24.9	6.76	91.2	7.14	33466	20.95
Sed-322-C120-0-0.5	Surrogate	01	6/18/2020 09:54:59	24.8	6.94	93.6	7.16	33371	20.89
Sed-323-C120-0-0.5	Surrogate	01	6/18/2020 09:55:26	24.8	6.92	93.4	7.19	33534	21.00
Sed-324-C120-0-0.5	Surrogate	01	6/18/2020 09:55:46	24.9	6.83	92.3	7.31	33417	20.91
Sed-325-C120-0-0.5	Surrogate	01	6/18/2020 09:56:08	24.9	6.96	93.5	7.43	32083	20.00
Sed-331-C120-0-0.5	Surrogate	01	6/18/2020 09:56:38	24.7	6.89	92.5	7.42	32675	20.41
Sed-333-C120-0-0.5	Surrogate	01	6/18/2020 09:57:03	24.6	6.83	91.6	7.52	33112	20.71
Sed-335-C120-0-0.5	Surrogate	01	6/18/2020 09:57:41	24.7	6.73	90.4	7.71	32857	20.53
Sed-337-C120-0-0.5	Surrogate	01	6/18/2020 09:57:57	24.8	6.97	92.7	7.75	30039	18.60
Sed-339-C120-0-0.5	Surrogate	01	6/18/2020 09:58:26	24.9	7.05	94.8	7.77	32673	20.40
Laboratory Control	Surrogate	02	6/19/2020 09:24:31	24.4	6.91	92.5	7.56	32643	20.39
Sed-321-C120-0-0.5	Surrogate	02	6/19/2020 09:24:49	24.4	6.85	91.7	7.50	32567	20.34
Sed-322-C120-0-0.5	Surrogate	02	6/19/2020 09:25:10	24.3	7.00	93.6	7.41	32729	20.45
Sed-323-C120-0-0.5	Surrogate	02	6/19/2020 09:25:25	24.4	6.95	93.0	7.40	32637	20.39
Sed-324-C120-0-0.5	Surrogate	02	6/19/2020 09:25:42	24.4	6.98	93.6	7.47	32707	20.43
Sed-325-C120-0-0.5	Surrogate	02	6/19/2020 09:26:13	24.5	6.99	93.4	7.56	31809	19.82
Sed-331-C120-0-0.5	Surrogate	02	6/19/2020 09:26:28	24.3	6.85	91.3	7.55	31664	19.72
Sed-333-C120-0-0.5	Surrogate	02	6/19/2020 09:26:43	24.3	6.91	92.2	7.58	32253	20.12
Sed-335-C120-0-0.5	Surrogate	02	6/19/2020 09:27:03	24.4	6.80	90.7	7.72	31870	19.86
Sed-337-C120-0-0.5	Surrogate	02	6/19/2020 09:27:21	24.4	6.81	90.9	7.75	31878	19.86
Sed-339-C120-0-0.5	Surrogate	02	6/19/2020 09:27:36	24.4	6.95	92.9	7.76	32027	19.97
Laboratory Control	Surrogate	03	6/20/2020 10:09:12	24.8	6.70	90.5	7.72	32416	20.23
Sed-321-C120-0-0.5	Surrogate	03	6/20/2020 10:09:31	24.8	6.74	90.9	7.61	32307	20.15
Sed-322-C120-0-0.5	Surrogate	03	6/20/2020 10:09:44	24.7	6.78	91.4	7.54	32462	20.26
Sed-323-C120-0-0.5	Surrogate	03	6/20/2020 10:09:56	24.7	6.83	92.1	7.52	32307	20.15
Sed-324-C120-0-0.5	Surrogate	03	6/20/2020 10:10:15	24.8	6.67	90.0	7.57	32433	20.24
Sed-325-C120-0-0.5	Surrogate	03	6/20/2020 10:10:36	24.8	6.79	91.4	7.62	31641	19.69
Sed-331-C120-0-0.5	Surrogate	03	6/20/2020 10:10:50	24.6	6.83	91.7	7.61	31516	19.61
Sed-333-C120-0-0.5	Surrogate	03	6/20/2020 10:11:10	24.6	6.85	92.1	7.67	32167	20.06

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	24.8	6.69	90.7		32763	20.47
Minimum:	20.0	4.01	54.6	6.71	28904	17.82
Maximum:	26.1	7.74	97.4	7.87	34939	21.97

Field ID	Replicate	Day	DateTime M/D/Y	Temp °C	DO mg/L	DO % Sat	pH SU	SpCond µS/cm	Salinity ppt
Sed-335-C120-0-0.5	Surrogate	03	6/20/2020 10:11:24	24.6	6.77	90.9	7.77	31773	19.79
Sed-337-C120-0-0.5	Surrogate	03	6/20/2020 10:11:37	24.7	6.76	91.0	7.81	31749	19.77
Sed-339-C120-0-0.5	Surrogate	03	6/20/2020 10:11:49	24.8	6.81	91.6	7.82	31494	19.59
Laboratory Control	Surrogate	04	6/21/2020 08:04:33	24.6	6.88	92.9	7.05	32768	20.47
Sed-321-C120-0-0.5	Surrogate	04	6/21/2020 08:04:56	24.6	6.79	91.6	7.15	32679	20.41
Sed-322-C120-0-0.5	Surrogate	04	6/21/2020 08:05:20	24.6	6.88	92.8	7.16	32860	20.54
Sed-323-C120-0-0.5	Surrogate	04	6/21/2020 08:05:37	24.6	6.90	93.1	7.22	32773	20.48
Sed-324-C120-0-0.5	Surrogate	04	6/21/2020 08:06:01	24.6	6.82	92.0	7.41	32728	20.44
Sed-325-C120-0-0.5	Surrogate	04	6/21/2020 08:06:16	24.7	6.88	92.7	7.48	32176	20.06
Sed-331-C120-0-0.5	Surrogate	04	6/21/2020 08:06:39	24.5	6.85	92.1	7.48	32117	20.03
Sed-333-C120-0-0.5	Surrogate	04	6/21/2020 08:07:17	24.5	6.88	92.5	7.61	32459	20.26
Sed-335-C120-0-0.5	Surrogate	04	6/21/2020 08:07:51	24.6	6.76	90.9	7.76	32242	20.11
Sed-337-C120-0-0.5	Surrogate	04	6/21/2020 08:08:16	24.6	6.70	90.1	7.75	32205	20.08
Sed-339-C120-0-0.5	Surrogate	04	6/21/2020 08:08:42	24.7	6.95	93.8	7.76	32461	20.26
Laboratory Control	Surrogate	05	6/22/2020 10:54:17	24.8	6.88	93.1	7.16	33109	20.70
Sed-321-C120-0-0.5	Surrogate	05	6/22/2020 10:54:51	24.8	6.70	90.7	7.20	33076	20.68
Sed-322-C120-0-0.5	Surrogate	05	6/22/2020 10:55:16	24.8	6.94	93.0	7.23	31012	19.26
Sed-323-C120-0-0.5	Surrogate	05	6/22/2020 10:55:33	24.8	6.81	92.2	7.26	33226	20.78
Sed-324-C120-0-0.5	Surrogate	05	6/22/2020 10:55:55	24.9	6.76	91.6	7.42	33215	20.78
Sed-325-C120-0-0.5	Surrogate	05	6/22/2020 10:56:18	24.9	6.90	93.0	7.54	31808	19.81
Sed-331-C120-0-0.5	Surrogate	05	6/22/2020 10:56:43	24.7	6.90	92.8	7.50	31713	19.75
Sed-333-C120-0-0.5	Surrogate	05	6/22/2020 10:57:02	24.7	6.88	92.7	7.58	32285	20.14
Sed-335-C120-0-0.5	Surrogate	05	6/22/2020 10:57:21	24.8	6.67	89.8	7.69	31912	19.88
Sed-337-C120-0-0.5	Surrogate	05	6/22/2020 10:57:40	24.8	6.65	89.6	7.73	31845	19.83
Sed-339-C120-0-0.5	Surrogate	05	6/22/2020 10:58:02	24.9	6.93	93.3	7.76	31281	19.45
Laboratory Control	Surrogate	06	6/23/2020 09:09:12	24.9	6.80	92.9	7.08	33424	20.92
Sed-321-C120-0-0.5	Surrogate	06	6/23/2020 09:09:38	24.8	6.59	89.8	7.17	33292	20.83
Sed-322-C120-0-0.5	Surrogate	06	6/23/2020 09:10:10	24.8	6.77	92.2	7.15	33502	20.98
Sed-323-C120-0-0.5	Surrogate	06	6/23/2020 09:10:39	24.8	6.84	93.3	7.25	33347	20.87
Sed-324-C120-0-0.5	Surrogate	06	6/23/2020 09:11:06	24.9	6.73	91.9	7.46	33429	20.92
Sed-325-C120-0-0.5	Surrogate	06	6/23/2020 09:11:28	24.9	6.85	93.1	7.53	31968	19.92
Sed-331-C120-0-0.5	Surrogate	06	6/23/2020 09:11:50	24.8	6.76	91.6	7.50	31986	19.93
Sed-333-C120-0-0.5	Surrogate	06	6/23/2020 09:12:12	24.8	6.74	91.5	7.57	32337	20.17
Sed-335-C120-0-0.5	Surrogate	06	6/23/2020 09:12:35	24.8	6.65	90.2	7.65	32083	20.00
Sed-337-C120-0-0.5	Surrogate	06	6/23/2020 09:12:48	24.9	6.54	88.7	7.68	32009	19.95
Sed-339-C120-0-0.5	Surrogate	06	6/23/2020 09:13:11	24.9	6.81	92.4	7.72	31983	19.93
Laboratory Control	Surrogate	07	6/24/2020 09:02:40	25.2	6.88	94.6	7.04	32318	20.15
Sed-321-C120-0-0.5	Surrogate	07	6/24/2020 09:03:06	25.1	6.68	91.6	7.14	32274	20.12
Sed-322-C120-0-0.5	Surrogate	07	6/24/2020 09:03:24	25.1	6.77	93.0	7.14	32688	20.41
Sed-323-C120-0-0.5	Surrogate	07	6/24/2020 09:03:45	25.2	6.81	93.5	7.20	32240	20.10

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	24.8	6.69	90.7		32763	20.47
Minimum:	20.0	4.01	54.6	6.71	28904	17.82
Maximum:	26.1	7.74	97.4	7.87	34939	21.97

Field ID	Replicate	Day	DateTime M/D/Y	Temp °C	DO mg/L	DO % Sat	pH SU	SpCond µS/cm	Salinity ppt
Sed-324-C120-0-0.5	Surrogate	07	6/24/2020 09:04:07	25.2	6.71	92.4	7.38	32502	20.28
Sed-325-C120-0-0.5	Surrogate	07	6/24/2020 09:04:36	25.3	6.82	93.9	7.51	32467	20.25
Sed-331-C120-0-0.5	Surrogate	07	6/24/2020 09:05:06	25.1	6.76	92.9	7.48	32488	20.27
Sed-333-C120-0-0.5	Surrogate	07	6/24/2020 09:05:17	25.2	6.79	93.4	7.51	32695	20.41
Sed-335-C120-0-0.5	Surrogate	07	6/24/2020 09:05:40	25.2	6.70	92.2	7.62	32514	20.29
Sed-337-C120-0-0.5	Surrogate	07	6/24/2020 09:06:06	25.2	6.56	90.1	7.67	32454	20.25
Sed-339-C120-0-0.5	Surrogate	07	6/24/2020 09:06:22	25.2	6.79	93.4	7.70	32464	20.25
Laboratory Control	Surrogate	08	6/25/2020 09:02:21	25.5	6.65	91.2	6.90	32707	20.42
Sed-321-C120-0-0.5	Surrogate	08	6/25/2020 09:02:46	25.3	6.46	88.2	7.01	32605	20.35
Sed-322-C120-0-0.5	Surrogate	08	6/25/2020 09:03:08	25.3	6.62	90.6	7.01	32899	20.55
Sed-323-C120-0-0.5	Surrogate	08	6/25/2020 09:03:39	25.3	6.69	91.4	7.15	32568	20.32
Sed-324-C120-0-0.5	Surrogate	08	6/25/2020 09:04:13	25.4	6.61	90.6	7.37	32784	20.47
Sed-325-C120-0-0.5	Surrogate	08	6/25/2020 09:04:36	25.4	6.71	91.9	7.46	32892	20.54
Sed-331-C120-0-0.5	Surrogate	08	6/25/2020 09:05:11	25.1	4.01	54.6	7.23	32884	20.54
Sed-333-C120-0-0.5	Surrogate	08	6/25/2020 09:05:38	25.3	6.63	90.7	7.45	33072	20.67
Sed-335-C120-0-0.5	Surrogate	08	6/25/2020 09:05:53	25.2	6.61	90.3	7.47	32814	20.49
Sed-337-C120-0-0.5	Surrogate	08	6/25/2020 09:06:08	25.3	6.48	88.7	7.51	32871	20.53
Sed-339-C120-0-0.5	Surrogate	08	6/25/2020 09:06:23	25.4	6.67	91.3	7.58	32579	20.33
Laboratory Control	Surrogate	09	6/26/2020 09:28:55	25.2	7.20	97.2	7.72	29735	18.39
Sed-321-C120-0-0.5	Surrogate	09	6/26/2020 09:29:23	25.1	7.03	94.8	7.57	29694	18.36
Sed-322-C120-0-0.5	Surrogate	09	6/26/2020 09:29:46	25.1	6.98	94.2	7.47	29869	18.48
Sed-323-C120-0-0.5	Surrogate	09	6/26/2020 09:30:12	25.1	7.23	97.4	7.48	29674	18.35
Sed-324-C120-0-0.5	Surrogate	09	6/26/2020 09:30:28	25.2	7.18	96.9	7.55	29729	18.38
Sed-325-C120-0-0.5	Surrogate	09	6/26/2020 09:31:00	25.2	7.21	97.2	7.64	29643	18.32
Sed-331-C120-0-0.5	Surrogate	09	6/26/2020 09:31:37	25.0	6.98	94.0	7.61	29717	18.38
Sed-333-C120-0-0.5	Surrogate	09	6/26/2020 09:31:55	25.1	7.15	96.4	7.65	29848	18.46
Sed-335-C120-0-0.5	Surrogate	09	6/26/2020 09:32:09	25.1	7.15	96.3	7.64	29544	18.26
Sed-337-C120-0-0.5	Surrogate	09	6/26/2020 09:32:25	25.1	6.91	93.1	7.65	29676	18.35
Sed-339-C120-0-0.5	Surrogate	09	6/26/2020 09:32:45	25.2	7.16	96.3	7.69	28904	17.82
Laboratory Control	Surrogate	10	6/27/2020 11:12:06	25.7	6.52	90.4	7.75	33283	20.81
Sed-321-C120-0-0.5	Surrogate	10	6/27/2020 11:12:20	25.5	6.55	90.4	7.67	33243	20.79
Sed-322-C120-0-0.5	Surrogate	10	6/27/2020 11:12:38	25.4	6.40	88.4	7.56	33398	20.89
Sed-323-C120-0-0.5	Surrogate	10	6/27/2020 11:12:59	25.5	6.55	90.4	7.54	33181	20.74
Sed-324-C120-0-0.5	Surrogate	10	6/27/2020 11:13:12	25.6	6.40	88.4	7.58	33273	20.80
Sed-325-C120-0-0.5	Surrogate	10	6/27/2020 11:13:34	25.6	6.70	92.1	7.67	31682	19.71
Sed-331-C120-0-0.5	Surrogate	10	6/27/2020 11:13:53	25.4	6.70	92.5	7.66	33422	20.91
Sed-333-C120-0-0.5	Surrogate	10	6/27/2020 11:14:11	25.5	6.53	90.3	7.69	33497	20.96
Sed-335-C120-0-0.5	Surrogate	10	6/27/2020 11:14:32	25.5	6.57	90.7	7.67	33203	20.76
Sed-337-C120-0-0.5	Surrogate	10	6/27/2020 11:14:51	25.6	6.26	86.6	7.68	33511	20.97
Sed-339-C120-0-0.5	Surrogate	10	6/27/2020 11:15:10	25.6	6.60	91.0	7.73	32544	20.30

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TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	24.8	6.69	90.7		32763	20.47
Minimum:	20.0	4.01	54.6	6.71	28904	17.82
Maximum:	26.1	7.74	97.4	7.87	34939	21.97

Field ID	Replicate	Day	DateTime M/D/Y	Temp °C	DO mg/L	DO % Sat	pH SU	SpCond µS/cm	Salinity ppt
Laboratory Control	Surrogate	11	6/28/2020 09:29:38	25.5	6.61	91.9	6.97	34560	21.69
Sed-321-C120-0-0.5	Surrogate	11	6/28/2020 09:30:02	25.4	6.44	89.3	7.08	34370	21.57
Sed-322-C120-0-0.5	Surrogate	11	6/28/2020 09:30:26	25.4	6.38	88.6	7.04	34604	21.73
Sed-323-C120-0-0.5	Surrogate	11	6/28/2020 09:30:46	25.5	6.60	91.7	7.12	34335	21.54
Sed-324-C120-0-0.5	Surrogate	11	6/28/2020 09:31:09	25.5	6.65	92.4	7.37	34323	21.53
Sed-325-C120-0-0.5	Surrogate	11	6/28/2020 09:32:01	25.5	6.72	93.6	7.59	34583	21.71
Sed-331-C120-0-0.5	Surrogate	11	6/28/2020 09:32:23	25.4	6.67	92.7	7.56	34619	21.74
Sed-333-C120-0-0.5	Surrogate	11	6/28/2020 09:32:46	25.5	6.61	91.9	7.62	34532	21.67
Sed-335-C120-0-0.5	Surrogate	11	6/28/2020 09:33:06	25.5	6.67	92.6	7.59	34270	21.49
Sed-337-C120-0-0.5	Surrogate	11	6/28/2020 09:33:24	25.5	6.35	88.3	7.60	34614	21.73
Sed-339-C120-0-0.5	Surrogate	11	6/28/2020 09:33:46	25.5	6.61	91.6	7.69	33538	20.99
Laboratory Control	Surrogate	12	6/29/2020 10:09:55	26.0	6.65	92.4	6.95	32921	20.55
Sed-321-C120-0-0.5	Surrogate	12	6/29/2020 10:10:10	25.9	6.43	89.2	7.06	32836	20.50
Sed-322-C120-0-0.5	Surrogate	12	6/29/2020 10:10:41	25.9	6.51	90.2	7.07	32984	20.60
Sed-323-C120-0-0.5	Surrogate	12	6/29/2020 10:11:10	25.9	6.64	92.1	7.22	32503	20.27
Sed-324-C120-0-0.5	Surrogate	12	6/29/2020 10:11:30	25.9	6.64	92.3	7.40	33022	20.62
Sed-325-C120-0-0.5	Surrogate	12	6/29/2020 10:11:56	25.8	6.67	92.5	7.54	32857	20.51
Sed-331-C120-0-0.5	Surrogate	12	6/29/2020 10:12:10	25.7	6.67	92.2	7.54	33015	20.62
Sed-333-C120-0-0.5	Surrogate	12	6/29/2020 10:12:32	25.7	6.61	91.7	7.60	33348	20.85
Sed-335-C120-0-0.5	Surrogate	12	6/29/2020 10:12:53	25.7	6.59	91.1	7.58	32868	20.52
Sed-337-C120-0-0.5	Surrogate	12	6/29/2020 10:13:14	25.8	6.36	88.2	7.58	33076	20.66
Sed-339-C120-0-0.5	Surrogate	12	6/29/2020 10:13:38	25.8	6.64	92.5	7.68	34249	21.47
Laboratory Control	Surrogate	13	6/30/2020 09:10:53	25.8	6.64	91.8	6.92	33461	20.93
Sed-321-C120-0-0.5	Surrogate	13	6/30/2020 09:11:06	25.6	6.52	89.8	7.04	33374	20.87
Sed-322-C120-0-0.5	Surrogate	13	6/30/2020 09:11:20	25.6	6.43	88.7	7.03	33569	21.01
Sed-323-C120-0-0.5	Surrogate	13	6/30/2020 09:11:42	25.6	6.64	91.5	7.16	33175	20.74
Sed-324-C120-0-0.5	Surrogate	13	6/30/2020 09:12:04	25.7	6.59	91.0	7.34	33497	20.96
Sed-325-C120-0-0.5	Surrogate	13	6/30/2020 09:12:19	25.7	6.71	92.6	7.44	33599	21.03
Sed-331-C120-0-0.5	Surrogate	13	6/30/2020 09:12:37	25.7	6.67	92.4	7.51	34447	21.61
Sed-333-C120-0-0.5	Surrogate	13	6/30/2020 09:13:10	25.5	6.65	92.0	7.55	34590	21.71
Sed-335-C120-0-0.5	Surrogate	13	6/30/2020 09:13:32	25.5	6.59	91.0	7.53	34405	21.59
Sed-337-C120-0-0.5	Surrogate	13	6/30/2020 09:13:54	25.6	6.37	88.2	7.51	34514	21.66
Sed-339-C120-0-0.5	Surrogate	13	6/30/2020 09:14:17	25.7	6.65	91.6	7.60	33066	20.66
Laboratory Control	Surrogate	14	7/1/2020 08:59:38	20.2	7.74	96.4	6.82	32201	20.14
Sed-321-C120-0-0.5	Surrogate	14	7/1/2020 09:00:31	20.3	7.49	93.4	7.13	32215	20.15
Sed-322-C120-0-0.5	Surrogate	14	7/1/2020 09:00:48	20.2	7.44	92.7	7.15	32456	20.31
Sed-323-C120-0-0.5	Surrogate	14	7/1/2020 09:01:01	20.3	7.51	93.7	7.21	32133	20.09
Sed-324-C120-0-0.5	Surrogate	14	7/1/2020 09:01:27	20.3	7.56	94.4	7.38	32336	20.23
Sed-325-C120-0-0.5	Surrogate	14	7/1/2020 09:01:48	20.3	7.66	95.3	7.48	31446	19.62
Sed-331-C120-0-0.5	Surrogate	14	7/1/2020 09:02:23	20.3	7.51	93.4	7.48	31253	19.49
Sed-333-C120-0-0.5	Surrogate	14	7/1/2020 09:02:45	20.3	7.52	93.8	7.54	32183	20.12

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	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	24.8	6.69	90.7		32763	20.47
Minimum:	20.0	4.01	54.6	6.71	28904	17.82
Maximum:	26.1	7.74	97.4	7.87	34939	21.97

Field ID	Replicate	Day	DateTime M/D/Y	Temp °C	DO mg/L	DO % Sat	pH SU	SpCond µS/cm	Salinity ppt
Sed-335-C120-0-0.5	Surrogate	14	7/1/2020 09:03:10	20.2	7.45	92.5	7.55	31555	19.69
Sed-337-C120-0-0.5	Surrogate	14	7/1/2020 09:03:39	20.1	7.42	91.9	7.55	31552	19.69
Sed-339-C120-0-0.5	Surrogate	14	7/1/2020 09:03:56	20.0	7.58	93.3	7.60	30370	18.88
Laboratory Control	Surrogate	15	7/2/2020 14:31:29	26.0	6.48	90.2	7.17	32574	20.31
Sed-321-C120-0-0.5	Surrogate	15	7/2/2020 14:31:58	25.9	6.43	89.3	7.25	32461	20.24
Sed-322-C120-0-0.5	Surrogate	15	7/2/2020 14:32:20	25.9	6.22	86.4	7.24	32577	20.32
Sed-323-C120-0-0.5	Surrogate	15	7/2/2020 14:32:40	25.9	6.47	89.9	7.30	32380	20.18
Sed-324-C120-0-0.5	Surrogate	15	7/2/2020 14:32:59	26.1	6.40	89.2	7.40	32664	20.37
Sed-325-C120-0-0.5	Surrogate	15	7/2/2020 14:33:15	26.0	6.49	90.1	7.50	31964	19.90
Sed-331-C120-0-0.5	Surrogate	15	7/2/2020 14:33:30	25.7	6.45	89.3	7.49	31925	19.87
Sed-333-C120-0-0.5	Surrogate	15	7/2/2020 14:33:45	25.8	6.45	89.5	7.54	32188	20.05
Sed-335-C120-0-0.5	Surrogate	15	7/2/2020 14:34:01	25.7	6.44	89.1	7.55	31870	19.83
Sed-337-C120-0-0.5	Surrogate	15	7/2/2020 14:34:22	25.8	6.41	88.8	7.55	32025	19.94
Sed-339-C120-0-0.5	Surrogate	15	7/2/2020 14:34:37	25.9	6.52	90.4	7.61	31609	19.65
Laboratory Control	Surrogate	16	7/3/2020 08:31:39	24.7	6.73	91.2	7.75	32942	20.59
Sed-321-C120-0-0.5	Surrogate	16	7/3/2020 08:31:53	24.6	6.66	90.2	7.70	32870	20.54
Sed-322-C120-0-0.5	Surrogate	16	7/3/2020 08:32:11	24.6	6.71	90.9	7.62	33013	20.64
Sed-323-C120-0-0.5	Surrogate	16	7/3/2020 08:32:25	24.6	6.80	92.0	7.62	32789	20.49
Sed-324-C120-0-0.5	Surrogate	16	7/3/2020 08:32:44	24.7	6.76	91.8	7.66	32994	20.63
Sed-325-C120-0-0.5	Surrogate	16	7/3/2020 08:33:06	24.7	6.73	91.2	7.71	32849	20.53
Sed-331-C120-0-0.5	Surrogate	16	7/3/2020 08:33:21	24.5	6.69	90.5	7.68	32801	20.50
Sed-333-C120-0-0.5	Surrogate	16	7/3/2020 08:33:39	24.6	6.68	90.3	7.70	32898	20.56
Sed-335-C120-0-0.5	Surrogate	16	7/3/2020 08:33:54	24.5	6.72	90.8	7.70	32698	20.43
Sed-337-C120-0-0.5	Surrogate	16	7/3/2020 08:34:15	24.6	6.52	88.1	7.67	32851	20.53
Sed-339-C120-0-0.5	Surrogate	16	7/3/2020 08:34:29	24.7	6.69	90.7	7.70	32732	20.45
Laboratory Control	Surrogate	17	7/4/2020 08:56:06	25.1	6.70	91.8	7.75	34373	21.57
Sed-321-C120-0-0.5	Surrogate	17	7/4/2020 08:56:28	24.9	6.70	91.4	7.67	34151	21.42
Sed-322-C120-0-0.5	Surrogate	17	7/4/2020 08:56:49	24.8	6.72	91.7	7.59	34317	21.54
Sed-323-C120-0-0.5	Surrogate	17	7/4/2020 08:57:09	24.8	6.78	92.4	7.60	34094	21.39
Sed-324-C120-0-0.5	Surrogate	17	7/4/2020 08:57:21	24.9	6.78	92.6	7.62	34243	21.49
Sed-325-C120-0-0.5	Surrogate	17	7/4/2020 08:57:40	24.8	6.79	92.6	7.70	34086	21.38
Sed-331-C120-0-0.5	Surrogate	17	7/4/2020 08:58:03	24.7	6.71	91.1	7.67	34051	21.36
Sed-333-C120-0-0.5	Surrogate	17	7/4/2020 08:58:24	24.7	6.72	91.5	7.71	33929	21.27
Sed-335-C120-0-0.5	Surrogate	17	7/4/2020 08:58:46	24.7	6.65	90.3	7.70	33761	21.16
Sed-337-C120-0-0.5	Surrogate	17	7/4/2020 08:59:08	24.7	6.71	91.3	7.65	34048	21.35
Sed-339-C120-0-0.5	Surrogate	17	7/4/2020 08:59:26	24.8	6.73	91.7	7.70	33827	21.20
Laboratory Control	Surrogate	18	7/5/2020 08:02:32	24.8	6.67	91.1	7.10	34935	21.97
Sed-321-C120-0-0.5	Surrogate	18	7/5/2020 08:02:55	24.8	6.54	89.2	7.22	34705	21.81
Sed-322-C120-0-0.5	Surrogate	18	7/5/2020 08:03:22	24.7	6.66	90.8	7.27	34939	21.97
Sed-323-C120-0-0.5	Surrogate	18	7/5/2020 08:03:33	24.7	6.79	92.6	7.34	34755	21.84

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Mean:	24.8	6.69	90.7		32763	20.47
Minimum:	20.0	4.01	54.6	6.71	28904	17.82
Maximum:	26.1	7.74	97.4	7.87	34939	21.97

Field ID	Replicate	Day	DateTime M/D/Y	Temp °C	DO mg/L	DO % Sat	pH SU	SpCond µS/cm	Salinity ppt
Sed-324-C120-0-0.5	Surrogate	18	7/5/2020 08:03:52	24.8	6.65	90.9	7.45	34854	21.91
Sed-325-C120-0-0.5	Surrogate	18	7/5/2020 08:04:35	24.7	6.84	92.8	7.62	33632	21.07
Sed-331-C120-0-0.5	Surrogate	18	7/5/2020 08:04:56	24.7	6.62	89.8	7.55	33601	21.05
Sed-333-C120-0-0.5	Surrogate	18	7/5/2020 08:05:11	24.7	6.73	91.4	7.58	33787	21.17
Sed-335-C120-0-0.5	Surrogate	18	7/5/2020 08:05:27	24.7	6.73	91.3	7.62	33530	21.00
Sed-337-C120-0-0.5	Surrogate	18	7/5/2020 08:05:47	24.7	6.71	91.1	7.56	33678	21.10
Sed-339-C120-0-0.5	Surrogate	18	7/5/2020 08:06:09	24.9	6.75	91.8	7.66	33452	20.94
Laboratory Control	Surrogate	19	7/6/2020 09:28:01	25.0	6.77	91.3	6.97	31676	19.71
Sed-321-C120-0-0.5	Surrogate	19	7/6/2020 09:28:19	24.9	6.73	90.6	7.12	31621	19.68
Sed-322-C120-0-0.5	Surrogate	19	7/6/2020 09:28:43	24.9	6.75	90.9	7.20	32119	20.02
Sed-323-C120-0-0.5	Surrogate	19	7/6/2020 09:28:57	24.9	6.88	92.6	7.28	31600	19.66
Sed-324-C120-0-0.5	Surrogate	19	7/6/2020 09:29:16	25.0	6.81	92.0	7.39	32048	19.97
Sed-325-C120-0-0.5	Surrogate	19	7/6/2020 09:29:38	25.0	6.88	92.7	7.50	31733	19.75
Sed-331-C120-0-0.5	Surrogate	19	7/6/2020 09:30:01	24.9	6.71	90.1	7.45	31380	19.51
Sed-333-C120-0-0.5	Surrogate	19	7/6/2020 09:30:13	24.9	6.74	90.9	7.48	32305	20.15
Sed-335-C120-0-0.5	Surrogate	19	7/6/2020 09:30:26	24.8	6.88	92.4	7.55	31655	19.70
Sed-337-C120-0-0.5	Surrogate	19	7/6/2020 09:30:41	24.9	6.86	92.0	7.52	30683	19.04
Sed-339-C120-0-0.5	Surrogate	19	7/6/2020 09:31:14	25.1	6.90	92.8	7.61	30772	19.09
Laboratory Control	Surrogate	20	7/7/2020 09:02:17	25.1	6.73	91.1	6.98	33331	20.85
Sed-321-C120-0-0.5	Surrogate	20	7/7/2020 09:02:41	24.9	6.57	88.7	7.15	33199	20.76
Sed-322-C120-0-0.5	Surrogate	20	7/7/2020 09:03:03	24.9	6.50	87.7	7.19	33357	20.87
Sed-323-C120-0-0.5	Surrogate	20	7/7/2020 09:03:24	25.0	6.74	91.0	7.31	33219	20.78
Sed-324-C120-0-0.5	Surrogate	20	7/7/2020 09:03:46	25.0	6.75	91.3	7.41	33244	20.79
Sed-325-C120-0-0.5	Surrogate	20	7/7/2020 09:03:58	25.0	6.81	91.8	7.47	32798	20.49
Sed-331-C120-0-0.5	Surrogate	20	7/7/2020 09:04:14	24.9	6.71	90.3	7.47	32646	20.38
Sed-333-C120-0-0.5	Surrogate	20	7/7/2020 09:04:25	25.0	6.69	90.2	7.49	32917	20.57
Sed-335-C120-0-0.5	Surrogate	20	7/7/2020 09:04:48	24.9	6.53	87.8	7.53	32620	20.37
Sed-337-C120-0-0.5	Surrogate	20	7/7/2020 09:05:11	24.9	6.71	90.3	7.49	32777	20.47
Sed-339-C120-0-0.5	Surrogate	20	7/7/2020 09:05:33	24.9	6.89	91.8	7.59	29794	18.43
Laboratory Control	Surrogate	21	7/8/2020 08:58:10	24.9	6.77	91.7	7.11	32900	20.56
Sed-321-C120-0-0.5	Surrogate	21	7/8/2020 08:58:26	24.8	6.59	89.1	7.24	32800	20.49
Sed-322-C120-0-0.5	Surrogate	21	7/8/2020 08:58:54	24.8	6.50	87.8	7.23	32900	20.56
Sed-323-C120-0-0.5	Surrogate	21	7/8/2020 08:59:26	24.8	6.78	91.6	7.41	32856	20.53
Sed-324-C120-0-0.5	Surrogate	21	7/8/2020 08:59:46	24.8	6.73	91.2	7.50	32960	20.60
Sed-325-C120-0-0.5	Surrogate	21	7/8/2020 09:00:10	24.8	6.86	92.8	7.60	32997	20.63
Sed-331-C120-0-0.5	Surrogate	21	7/8/2020 09:00:29	24.7	6.66	89.9	7.55	32904	20.56
Sed-333-C120-0-0.5	Surrogate	21	7/8/2020 09:00:42	24.8	6.69	90.4	7.58	33028	20.65
Sed-335-C120-0-0.5	Surrogate	21	7/8/2020 09:00:54	24.7	6.65	89.8	7.61	32809	20.50
Sed-337-C120-0-0.5	Surrogate	21	7/8/2020 09:01:08	24.7	6.72	90.8	7.58	32983	20.62
Sed-339-C120-0-0.5	Surrogate	21	7/8/2020 09:01:31	24.8	6.79	91.2	7.66	31126	19.34

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	24.8	6.69	90.7		32763	20.47
Minimum:	20.0	4.01	54.6	6.71	28904	17.82
Maximum:	26.1	7.74	97.4	7.87	34939	21.97

Field ID	Replicate	Day	DateTime M/D/Y	Temp °C	DO mg/L	DO % Sat	pH SU	SpCond µS/cm	Salinity ppt
Laboratory Control	Surrogate	22	7/9/2020 16:33:02	24.9	6.15	83.9	7.57	34015	21.33
Sed-321-C120-0-0.5	Surrogate	22	7/9/2020 16:33:30	24.9	5.82	79.3	7.52	33858	21.22
Sed-322-C120-0-0.5	Surrogate	22	7/9/2020 16:33:53	24.9	6.25	85.2	7.49	34117	21.40
Sed-323-C120-0-0.5	Surrogate	22	7/9/2020 16:34:10	24.9	6.54	89.1	7.55	33955	21.29
Sed-324-C120-0-0.5	Surrogate	22	7/9/2020 16:34:28	24.9	6.53	89.0	7.59	33921	21.26
Sed-325-C120-0-0.5	Surrogate	22	7/9/2020 16:34:53	24.9	6.50	88.3	7.65	33035	20.65
Sed-331-C120-0-0.5	Surrogate	22	7/9/2020 16:35:13	24.8	6.48	87.8	7.62	32930	20.58
Sed-333-C120-0-0.5	Surrogate	22	7/9/2020 16:35:38	24.8	6.26	85.0	7.63	33100	20.70
Sed-335-C120-0-0.5	Surrogate	22	7/9/2020 16:36:02	24.8	6.28	85.0	7.67	32752	20.46
Sed-337-C120-0-0.5	Surrogate	22	7/9/2020 16:36:21	24.9	6.43	87.3	7.64	33003	20.63
Sed-339-C120-0-0.5	Surrogate	22	7/9/2020 16:36:43	24.9	6.32	85.4	7.65	32099	20.01
Laboratory Control	Surrogate	23	7/10/2020 11:45:34	25.3	6.73	91.7	7.53	32714	20.42
Sed-321-C120-0-0.5	Surrogate	23	7/10/2020 11:45:55	25.2	6.40	87.0	7.48	32540	20.30
Sed-322-C120-0-0.5	Surrogate	23	7/10/2020 11:46:20	25.2	6.50	88.4	7.46	32868	20.53
Sed-323-C120-0-0.5	Surrogate	23	7/10/2020 11:46:50	25.2	6.70	91.1	7.54	32523	20.29
Sed-324-C120-0-0.5	Surrogate	23	7/10/2020 11:47:11	25.3	6.71	91.4	7.58	32822	20.50
Sed-325-C120-0-0.5	Surrogate	23	7/10/2020 11:47:33	25.2	6.84	93.2	7.63	32936	20.58
Sed-331-C120-0-0.5	Surrogate	23	7/10/2020 11:47:58	25.0	6.69	90.8	7.61	32909	20.56
Sed-333-C120-0-0.5	Surrogate	23	7/10/2020 11:48:22	25.1	6.43	87.3	7.60	33034	20.65
Sed-335-C120-0-0.5	Surrogate	23	7/10/2020 11:48:46	25.1	6.64	90.1	7.67	32843	20.52
Sed-337-C120-0-0.5	Surrogate	23	7/10/2020 11:49:11	25.1	6.72	91.4	7.63	33077	20.68
Sed-339-C120-0-0.5	Surrogate	23	7/10/2020 11:49:37	25.1	6.62	89.7	7.64	32008	19.94
Laboratory Control	Surrogate	24	7/11/2020 09:32:26	25.1	6.46	88.4	6.84	32269	20.12
Sed-321-C120-0-0.5	Surrogate	24	7/11/2020 09:32:56	24.9	6.12	83.5	7.07	32089	20.00
Sed-322-C120-0-0.5	Surrogate	24	7/11/2020 09:33:17	24.9	6.20	84.7	7.14	32527	20.30
Sed-323-C120-0-0.5	Surrogate	24	7/11/2020 09:33:38	24.9	6.63	90.5	7.29	32165	20.05
Sed-324-C120-0-0.5	Surrogate	24	7/11/2020 09:33:57	25.0	6.56	89.8	7.39	32527	20.30
Sed-325-C120-0-0.5	Surrogate	24	7/11/2020 09:34:22	25.0	6.74	92.3	7.51	32714	20.43
Sed-331-C120-0-0.5	Surrogate	24	7/11/2020 09:35:05	24.8	5.99	81.6	7.39	32546	20.32
Sed-333-C120-0-0.5	Surrogate	24	7/11/2020 09:35:25	24.8	6.31	86.1	7.47	32971	20.61
Sed-335-C120-0-0.5	Surrogate	24	7/11/2020 09:35:52	24.7	6.41	87.4	7.57	32717	20.43
Sed-337-C120-0-0.5	Surrogate	24	7/11/2020 09:36:07	24.8	6.57	89.6	7.54	32909	20.57
Sed-339-C120-0-0.5	Surrogate	24	7/11/2020 09:36:25	24.9	6.45	87.8	7.57	31657	19.70
Laboratory Control	Surrogate	25	7/12/2020 08:56:58	24.7	6.51	89.2	7.43	32683	20.41
Sed-321-C120-0-0.5	Surrogate	25	7/12/2020 08:57:14	24.6	6.35	86.7	7.41	32521	20.30
Sed-322-C120-0-0.5	Surrogate	25	7/12/2020 08:57:36	24.6	6.29	85.9	7.37	32824	20.51
Sed-323-C120-0-0.5	Surrogate	25	7/12/2020 08:57:59	24.6	6.49	88.6	7.44	32517	20.30
Sed-324-C120-0-0.5	Surrogate	25	7/12/2020 08:58:20	24.7	6.52	89.3	7.49	32669	20.40
Sed-325-C120-0-0.5	Surrogate	25	7/12/2020 08:58:42	24.6	6.80	92.7	7.57	31956	19.91
Sed-331-C120-0-0.5	Surrogate	25	7/12/2020 08:59:04	24.6	6.50	88.5	7.50	31879	19.86
Sed-333-C120-0-0.5	Surrogate	25	7/12/2020 08:59:19	24.6	6.42	87.5	7.53	32284	20.14

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation
TASK: Daily Water Qualities

	Temp	DO	DO%	pH	SpCond	Salinity
Mean:	24.8	6.69	90.7		32763	20.47
Minimum:	20.0	4.01	54.6	6.71	28904	17.82
Maximum:	26.1	7.74	97.4	7.87	34939	21.97

Field ID	Replicate	Day	DateTime M/D/Y	Temp °C	DO mg/L	DO % Sat	pH SU	SpCond µS/cm	Salinity ppt
Sed-335-C120-0-0.5	Surrogate	25	7/12/2020 08:59:31	24.6	6.36	86.6	7.56	31905	19.88
Sed-337-C120-0-0.5	Surrogate	25	7/12/2020 08:59:47	24.6	6.62	90.1	7.53	32109	20.02
Sed-339-C120-0-0.5	Surrogate	25	7/12/2020 09:00:08	24.6	6.55	89.4	7.60	32279	20.14
Laboratory Control	Surrogate	26	7/13/2020 09:33:53	24.9	6.76	92.6	6.87	33844	21.21
Sed-321-C120-0-0.5	Surrogate	26	7/13/2020 09:34:11	24.8	6.48	88.6	7.06	33438	20.93
Sed-322-C120-0-0.5	Surrogate	26	7/13/2020 09:34:51	24.7	6.37	86.9	7.14	33606	21.05
Sed-323-C120-0-0.5	Surrogate	26	7/13/2020 09:35:23	24.7	6.71	91.5	7.31	33086	20.69
Sed-324-C120-0-0.5	Surrogate	26	7/13/2020 09:35:30	24.7	6.68	91.2	7.33	33308	20.84
Sed-325-C120-0-0.5	Surrogate	26	7/13/2020 09:35:46	24.9	6.68	91.5	7.39	33475	20.96
Sed-331-C120-0-0.5	Surrogate	26	7/13/2020 09:36:24	24.8	6.98	94.6	7.54	31412	19.54
Sed-333-C120-0-0.5	Surrogate	26	7/13/2020 09:36:50	24.7	6.75	91.8	7.49	32445	20.25
Sed-335-C120-0-0.5	Surrogate	26	7/13/2020 09:37:12	24.6	6.60	89.7	7.51	32546	20.32
Sed-337-C120-0-0.5	Surrogate	26	7/13/2020 09:37:26	24.6	6.71	91.1	7.57	32381	20.21
Sed-339-C120-0-0.5	Surrogate	26	7/13/2020 09:38:07	24.7	6.80	92.4	7.57	32281	20.13
Laboratory Control	Surrogate	27	7/14/2020 08:02:44	24.6	6.51	88.6	6.71	34124	21.41
Sed-321-C120-0-0.5	Surrogate	27	7/14/2020 08:03:11	24.6	6.28	85.3	7.01	33824	21.20
Sed-322-C120-0-0.5	Surrogate	27	7/14/2020 08:03:28	24.5	6.16	83.6	7.06	33994	21.32
Sed-323-C120-0-0.5	Surrogate	27	7/14/2020 08:03:44	24.5	6.49	88.0	7.17	33876	21.24
Sed-324-C120-0-0.5	Surrogate	27	7/14/2020 08:03:56	24.6	6.54	88.9	7.25	33927	21.27
Sed-325-C120-0-0.5	Surrogate	27	7/14/2020 08:04:07	24.6	6.54	88.7	7.31	33380	20.89
Sed-331-C120-0-0.5	Surrogate	27	7/14/2020 08:04:26	24.6	6.29	85.1	7.31	33048	20.67
Sed-333-C120-0-0.5	Surrogate	27	7/14/2020 08:04:41	24.5	6.28	84.9	7.35	33222	20.79
Sed-335-C120-0-0.5	Surrogate	27	7/14/2020 08:05:01	24.5	6.09	82.3	7.40	33216	20.78
Sed-337-C120-0-0.5	Surrogate	27	7/14/2020 08:05:36	24.5	6.34	85.7	7.34	33261	20.81
Sed-339-C120-0-0.5	Surrogate	27	7/14/2020 08:06:04	24.5	6.56	88.6	7.48	32803	20.50
Laboratory Control	Surrogate	28	7/15/2020 08:18:33	24.8	6.64	89.7	7.12	34271	21.51
Sed-321-C120-0-0.5	Surrogate	28	7/15/2020 08:18:57	24.8	6.48	87.4	7.24	34004	21.32
Sed-322-C120-0-0.5	Surrogate	28	7/15/2020 08:19:19	24.7	6.25	84.3	7.22	34210	21.47
Sed-323-C120-0-0.5	Surrogate	28	7/15/2020 08:19:41	24.7	6.60	89.0	7.32	33886	21.24
Sed-324-C120-0-0.5	Surrogate	28	7/15/2020 08:20:05	24.8	6.61	89.3	7.43	34133	21.41
Sed-325-C120-0-0.5	Surrogate	28	7/15/2020 08:20:29	24.8	6.74	91.0	7.50	33915	21.26
Sed-331-C120-0-0.5	Surrogate	28	7/15/2020 08:20:52	24.7	6.46	86.9	7.47	33751	21.15
Sed-333-C120-0-0.5	Surrogate	28	7/15/2020 08:21:13	24.6	6.27	84.3	7.49	33755	21.15
Sed-335-C120-0-0.5	Surrogate	28	7/15/2020 08:21:30	24.6	6.34	85.2	7.54	33826	21.20
Sed-337-C120-0-0.5	Surrogate	28	7/15/2020 08:21:51	24.6	6.50	87.4	7.47	33871	21.23
Sed-339-C120-0-0.5	Surrogate	28	7/15/2020 08:22:13	24.7	6.38	85.9	7.52	33817	21.19

28 day *Leptocheirus plumulosus* Survival, Growth and Reproduction Sediment Evaluation

Ammonia Data

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation

TASK: Overlying Water Ammonia Summary
METHOD: SM 4500-NH3 G

			Ammonia (mg/L)							L	M	N	O	P	Q	R	S
										temp	pH	salinity	Tot NH3	Temp	I	pKa	F_{NH3}
Sample ID	**Day**	**Lab Code**	**Total**	**Qual**	**Unionized**	**QLimit**	**Units**	**Sampled**	**Analyzed**	(°C)	(SU)	(ppt)	(mg/L)	(°K)			(%)
Laboratory Control	00	34122-211	ND		0.0030	0.1	mg/L as N	06/17/20 0945	06/23/20 1116	25.5	7.76	20.64	0.1	298.7	0.420	9.294	3.0%
Sed-321-C120-0-0.5	00	34122-212	1.59		0.0282	0.1	mg/L as N	06/17/20 0945	06/23/20 1117	25.5	7.53	20.64	1.59	298.7	0.420	9.294	1.8%
Sed-322-C120-0-0.5	00	34122-213	1.98		0.0281	0.1	mg/L as N	06/17/20 0945	06/23/20 1118	25.5	7.43	20.45	1.98	298.7	0.416	9.293	1.4%
Sed-323-C120-0-0.5	00	34122-214	1.21		0.0136	0.1	mg/L as N	06/17/20 0945	06/23/20 1119	25.5	7.33	20.90	1.21	298.7	0.425	9.294	1.1%
Sed-324-C120-0-0.5	00	34122-215	1.98		0.0220	0.1	mg/L as N	06/17/20 0945	06/23/20 1119	25.6	7.32	20.67	1.98	298.8	0.421	9.294	1.1%
Sed-325-C120-0-0.5	00	34122-216	0.88		0.0120	0.1	mg/L as N	06/17/20 0945	06/23/20 1120	25.6	7.41	20.81	0.88	298.8	0.424	9.294	1.4%
Sed-331-C120-0-0.5	00	34122-217	0.34		0.0052	0.1	mg/L as N	06/17/20 0945	06/23/20 1121	25.5	7.46	20.32	0.34	298.7	0.413	9.293	1.5%
Sed-333-C120-0-0.5	00	34122-218	0.23		0.0041	0.1	mg/L as N	06/17/20 0945	06/23/20 1122	25.4	7.53	20.72	0.23	298.6	0.422	9.294	1.8%
Sed-335-C120-0-0.5	00	34122-219	0.17		0.0050	0.1	mg/L as N	06/17/20 0945	06/23/20 1123	25.5	7.75	20.54	0.17	298.7	0.418	9.293	2.9%
Sed-337-C120-0-0.5	00	34122-220	0.7		0.0255	0.1	mg/L as N	06/17/20 0945	06/23/20 1125	25.5	7.85	20.47	0.7	298.7	0.416	9.293	3.6%
Sed-339-C120-0-0.5	00	34122-221	ND		0.0038	0.1	mg/L as N	06/17/20 0945	06/23/20 1126	25.5	7.87	20.49	0.1	298.7	0.417	9.293	3.8%
Laboratory Control	07	34122-311	0.32		0.0018	0.1	mg/L as N	06/24/20 0920	06/29/20 1525	25.2	7.04	20.15	0.32	298.4	0.410	9.293	0.6%
Sed-321-C120-0-0.5	07	34122-312	1.14		0.0081	0.1	mg/L as N	06/24/20 0920	06/29/20 1526	25.1	7.14	20.12	1.14	298.3	0.409	9.292	0.7%
Sed-322-C120-0-0.5	07	34122-313	0.84		0.0060	0.1	mg/L as N	06/24/20 0920	06/29/20 1526	25.1	7.14	20.41	0.84	298.3	0.415	9.293	0.7%
Sed-323-C120-0-0.5	07	34122-314	0.3		0.0025	0.1	mg/L as N	06/24/20 0920	06/29/20 1527	25.2	7.20	20.10	0.3	298.4	0.409	9.292	0.8%
Sed-324-C120-0-0.5	07	34122-315	0.7		0.0087	0.1	mg/L as N	06/24/20 0920	06/29/20 1528	25.2	7.38	20.28	0.7	298.4	0.413	9.293	1.2%
Sed-325-C120-0-0.5	07	34122-316	0.49		0.0082	0.1	mg/L as N	06/24/20 0920	06/29/20 1529	25.3	7.51	20.25	0.49	298.5	0.412	9.293	1.7%
Sed-331-C120-0-0.5	07	34122-317	0.54		0.0083	0.1	mg/L as N	06/24/20 0920	06/29/20 1530	25.1	7.48	20.27	0.54	298.3	0.412	9.293	1.5%
Sed-333-C120-0-0.5	07	34122-318	0.62		0.0103	0.1	mg/L as N	06/24/20 0920	06/29/20 1532	25.2	7.51	20.41	0.62	298.4	0.415	9.293	1.7%
Sed-335-C120-0-0.5	07	34122-319	0.41		0.0087	0.1	mg/L as N	06/24/20 0920	06/29/20 1539	25.2	7.62	20.29	0.41	298.4	0.413	9.293	2.1%
Sed-337-C120-0-0.5	07	34122-320	0.65		0.0155	0.1	mg/L as N	06/24/20 0920	06/29/20 1540	25.2	7.67	20.25	0.65	298.4	0.412	9.293	2.4%
Sed-339-C120-0-0.5	07	34122-321	0.15		0.0038	0.1	mg/L as N	06/24/20 0920	06/29/20 1542	25.2	7.70	20.25	0.15	298.4	0.412	9.293	2.6%
Laboratory Control	14	34122-411	0.18		0.0004	0.1	mg/L as N	07/01/20 1030	07/07/20 1344	20.2	6.82	20.14	0.18	293.4	0.410	9.293	0.2%
Sed-321-C120-0-0.5	14	34122-412	0.23		0.0011	0.1	mg/L as N	07/01/20 1030	07/07/20 1345	20.3	7.13	20.15	0.23	293.5	0.410	9.293	0.5%
Sed-322-C120-0-0.5	14	34122-413	0.2		0.0010	0.1	mg/L as N	07/01/20 1030	07/07/20 1346	20.2	7.15	20.31	0.2	293.4	0.413	9.293	0.5%
Sed-323-C120-0-0.5	14	34122-414	0.24		0.0014	0.1	mg/L as N	07/01/20 1030	07/07/20 1347	20.3	7.21	20.09	0.24	293.5	0.409	9.292	0.6%
Sed-324-C120-0-0.5	14	34122-415	0.29		0.0025	0.1	mg/L as N	07/01/20 1030	07/07/20 1348	20.3	7.38	20.23	0.29	293.5	0.411	9.293	0.9%
Sed-325-C120-0-0.5	14	34122-416	0.2		0.0022	0.1	mg/L as N	07/01/20 1030	07/07/20 1348	20.3	7.48	19.62	0.2	293.5	0.399	9.291	1.1%
Sed-331-C120-0-0.5	14	34122-417	0.3		0.0033	0.1	mg/L as N	07/01/20 1030	07/07/20 1349	20.3	7.48	19.49	0.3	293.5	0.396	9.291	1.1%
Sed-333-C120-0-0.5	14	34122-418	0.26		0.0032	0.1	mg/L as N	07/01/20 1030	07/07/20 1350	20.3	7.54	20.12	0.26	293.5	0.409	9.292	1.2%
Sed-335-C120-0-0.5	14	34122-419	0.23		0.0029	0.1	mg/L as N	07/01/20 1030	07/07/20 1353	20.2	7.55	19.69	0.23	293.4	0.400	9.291	1.3%
Sed-337-C120-0-0.5	14	34122-420	0.88		0.0111	0.1	mg/L as N	07/01/20 1030	07/07/20 1356	20.1	7.55	19.69	0.88	293.3	0.400	9.291	1.3%
Sed-339-C120-0-0.5	14	34122-421	0.19		0.0027	0.1	mg/L as N	07/01/20 1030	07/07/20 1359	20.0	7.60	18.88	0.19	293.2	0.384	9.289	1.4%
Laboratory Control	21	34122-511	0.2		0.0013	0.1	mg/L as N	07/08/20 0930	07/09/20 1531	24.9	7.11	20.56	0.2	298.1	0.418	9.294	0.7%

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation

TASK: Overlying Water Ammonia Summary
METHOD: SM 4500-NH3 G

			Ammonia (mg/L)							L	M	N	O	P	Q	R	S
										temp	pH	salinity	Tot NH3	Temp	I	pKa	F_{NH3}
Sample ID	**Day**	**Lab Code**	**Total**	**Qual**	**Unionized**	**QLimit**	**Units**	**Sampled**	**Analyzed**	(°C)	(SU)	(ppt)	(mg/L)	(°K)			(%)
Sed-321-C120-0-0.5	21	34122-512	ND		0.0009	0.1	mg/L as N	07/08/20 0930	07/09/20 1532	24.8	7.24	20.49	0.1	298.0	0.417	9.293	0.9%
Sed-322-C120-0-0.5	21	34122-513	0.16		0.0014	0.1	mg/L as N	07/08/20 0930	07/09/20 1533	24.8	7.23	20.56	0.16	298.0	0.418	9.294	0.9%
Sed-323-C120-0-0.5	21	34122-514	ND		0.0013	0.1	mg/L as N	07/08/20 0930	07/09/20 1534	24.8	7.41	20.53	0.1	298.0	0.418	9.293	1.3%
Sed-324-C120-0-0.5	21	34122-515	0.12		0.0019	0.1	mg/L as N	07/08/20 0930	07/09/20 1535	24.8	7.50	20.60	0.12	298.0	0.419	9.294	1.6%
Sed-325-C120-0-0.5	21	34122-516	0.12		0.0024	0.1	mg/L as N	07/08/20 0930	07/09/20 1536	24.8	7.60	20.63	0.12	298.0	0.420	9.294	2.0%
Sed-331-C120-0-0.5	21	34122-517	0.15		0.0026	0.1	mg/L as N	07/08/20 0930	07/09/20 1536	24.7	7.55	20.56	0.15	297.9	0.418	9.294	1.8%
Sed-333-C120-0-0.5	21	34122-518	0.13		0.0025	0.1	mg/L as N	07/08/20 0930	07/09/20 1537	24.8	7.58	20.65	0.13	298.0	0.420	9.294	1.9%
Sed-335-C120-0-0.5	21	34122-519	0.26		0.0052	0.1	mg/L as N	07/08/20 0930	07/09/20 1538	24.7	7.61	20.50	0.26	297.9	0.417	9.293	2.0%
Sed-337-C120-0-0.5	21	34122-520	0.34		0.0064	0.1	mg/L as N	07/08/20 0930	07/09/20 1541	24.7	7.58	20.62	0.34	297.9	0.420	9.294	1.9%
Sed-339-C120-0-0.5	21	34122-521	ND		0.0023	0.1	mg/L as N	07/08/20 0930	07/09/20 1514	24.8	7.66	19.34	0.1	298.0	0.393	9.291	2.3%
Laboratory Control	28	34122-611	0.34		0.0022	0.1	mg/L as N	07/15/20 0900	07/15/20 1413	24.8	7.12	21.51	0.34	298.0	0.438	9.296	0.7%
Sed-321-C120-0-0.5	28	34122-612	0.2		0.0017	0.1	mg/L as N	07/15/20 0900	07/15/20 1414	24.8	7.24	21.32	0.2	298.0	0.434	9.295	0.9%
Sed-322-C120-0-0.5	28	34122-613	0.15		0.0012	0.1	mg/L as N	07/15/20 0900	07/15/20 1415	24.7	7.22	21.47	0.15	297.9	0.437	9.296	0.8%
Sed-323-C120-0-0.5	28	34122-614	0.18		0.0019	0.1	mg/L as N	07/15/20 0900	07/15/20 1418	24.7	7.32	21.24	0.18	297.9	0.432	9.295	1.0%
Sed-324-C120-0-0.5	28	34122-615	0.14		0.0019	0.1	mg/L as N	07/15/20 0900	07/15/20 1422	24.8	7.43	21.41	0.14	298.0	0.436	9.296	1.3%
Sed-325-C120-0-0.5	28	34122-616	0.16		0.0025	0.1	mg/L as N	07/15/20 0900	07/15/20 1423	24.8	7.50	21.26	0.16	298.0	0.433	9.295	1.6%
Sed-331-C120-0-0.5	28	34122-617	0.12		0.0017	0.1	mg/L as N	07/15/20 0900	07/15/20 1424	24.7	7.47	21.15	0.12	297.9	0.431	9.295	1.5%
Sed-333-C120-0-0.5	28	34122-618	0.17		0.0026	0.1	mg/L as N	07/15/20 0900	07/15/20 1425	24.6	7.49	21.15	0.17	297.8	0.431	9.295	1.5%
Sed-335-C120-0-0.5	28	34122-619	0.45		0.0076	0.1	mg/L as N	07/15/20 0900	07/15/20 1426	24.6	7.54	21.20	0.45	297.8	0.432	9.295	1.7%
Sed-337-C120-0-0.5	28	34122-620	0.29		0.0042	0.1	mg/L as N	07/15/20 0900	07/15/20 1426	24.6	7.47	21.23	0.29	297.8	0.432	9.295	1.4%
Sed-339-C120-0-0.5	28	34122-621	0.12		0.0020	0.1	mg/L as N	07/15/20 0900	07/15/20 1427	24.7	7.52	21.19	0.12	297.9	0.431	9.295	1.6%

Notes:

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions and USEPA Ammonia Criteria (Engle 2010)
Consistent with USEPA AWQC (1989) and Whitfield (1974).

Where: I = Ionic Strength (19.9273*N11)/(1000-1.005109*N11)
pKa = ionization constant of ammonium ion in aqueous saline solution (+9.245+0.116*Q11)
F_{NH3} = fraction of UIA (+1/(1+10^(R11+0.0324*(298-P11)+((0.0415*1)/P11)-M11)))
Tot NH3 = total ammonia, or QLimit if ND
pressure in F_{NH3} assumed to be 1 atm

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation

TASK: Pore Water Ammonia Summary
METHOD: SM 4500-NH3 G

			Ammonia (mg/L)							L	M	N	O	P	Q	R	S
										temp	pH	salinity	Tot NH3	Temp	I	pKa	F_{NH3}
Sample ID	**Day**	**Lab Code**	**Total**	**Qual**	**Unionized**	**QLimit**	**Units**	**Sampled**	**Analyzed**	(°C)	(SU)	(ppt)	(mg/L)	(°K)			(%)
Pre-Assay																	
Laboratory Control	-06	34122-100	1.7		0.0029	0.1	mg/L as N	06/09/20 0930	06/09/20 1402	19.0	6.72	22.0	1.7	292.2	0.448	9.297	0.2%
Sed-321-C120-0-0.5	-06	34122-101	4.24		0.0045	0.1	mg/L as N	06/09/20 0930	06/09/20 1403	19.4	6.49	18.7	4.24	292.6	0.380	9.289	0.1%
Sed-322-C120-0-0.5	-06	34122-102	2.33		0.0032	0.1	mg/L as N	06/09/20 0930	06/09/20 1404	19.1	6.62	19.3	2.33	292.3	0.392	9.290	0.1%
Sed-323-C120-0-0.5	-06	34122-103	6.6		0.0064	0.1	mg/L as N	06/09/20 0930	06/09/20 1405	19.3	6.45	16.9	6.6	292.5	0.343	9.285	0.1%
Sed-324-C120-0-0.5	-06	34122-104	4.76		0.0031	0.1	mg/L as N	06/09/20 0930	06/09/20 1406	19.2	6.28	18.4	4.76	292.4	0.374	9.288	0.1%
Sed-325-C120-0-0.5	-06	34122-105	2.75		0.0013	0.1	mg/L as N	06/09/20 0930	06/09/20 1407	19.3	6.13	18.5	2.75	292.5	0.376	9.289	0.0%
Sed-331-C120-0-0.5	-06	34122-106	3.82		0.0035	0.1	mg/L as N	06/09/20 0930	06/09/20 1407	19.4	6.40	5.9	3.82	292.6	0.118	9.259	0.1%
Sed-333-C120-0-0.5	-06	34122-107	3.48		0.0187	0.1	mg/L as N	06/09/20 0930	06/09/20 1410	19.4	7.20	18.9	3.48	292.6	0.384	9.290	0.5%
Sed-335-C120-0-0.5	-06	34122-108	3.86		0.0220	0.1	mg/L as N	06/09/20 0930	06/09/20 1413	19.5	7.22	18.1	3.86	292.7	0.367	9.288	0.6%
Sed-337-C120-0-0.5	-06	34122-109	9.36		0.0410	0.1	mg/L as N	06/09/20 0930	06/09/20 1416	19.5	7.11	20.2	9.36	292.7	0.411	9.293	0.4%
Sed-339-C120-0-0.5	-06	34122-110	0.2		0.0021	0.1	mg/L as N	06/09/20 0930	06/09/20 1417	19.2	7.51	19.6	0.2	292.4	0.398	9.291	1.1%
In-Life																	
Laboratory Control	00	34122-200	1.58		0.0036	0.1	mg/L as N	06/17/20 0945	06/23/20 1058	22.0	6.75	20.9	1.58	295.2	0.425	9.294	0.2%
Sed-321-C120-0-0.5	00	34122-201	3.86		0.0041	0.1	mg/L as N	06/17/20 0945	06/23/20 1058	22.0	6.41	20.0	3.86	295.2	0.407	9.292	0.1%
Sed-322-C120-0-0.5	00	34122-202	4.45		0.0050	0.1	mg/L as N	06/17/20 0945	06/23/20 1059	22.1	6.43	19.6	4.45	295.3	0.398	9.291	0.1%
Sed-323-C120-0-0.5	00	34122-203	3.3		0.0034	0.1	mg/L as N	06/17/20 0945	06/23/20 1100	21.9	6.40	19.8	3.3	295.1	0.403	9.292	0.1%
Sed-324-C120-0-0.5	00	34122-204	2.88		0.0067	0.1	mg/L as N	06/17/20 0945	06/23/20 1101	21.4	6.77	19.8	2.88	294.6	0.403	9.292	0.2%
Sed-325-C120-0-0.5	00	34122-205	4.6		0.0040	0.1	mg/L as N	06/17/20 0945	06/23/20 1102	21.3	6.35	20.3	4.6	294.5	0.413	9.293	0.1%
Sed-331-C120-0-0.5	00	34122-206	6.04		0.0041	0.1	mg/L as N	06/17/20 0945	06/23/20 1110	21.1	6.24	15.4	6.04	294.3	0.312	9.281	0.1%
Sed-333-C120-0-0.5	00	34122-207	0.58		0.0038	0.1	mg/L as N	06/17/20 0945	06/23/20 1111	21.4	7.22	20.1	0.58	294.6	0.409	9.292	0.6%
Sed-335-C120-0-0.5	00	34122-208	0.63		0.0035	0.1	mg/L as N	06/17/20 0945	06/23/20 1112	22.2	7.12	20.1	0.63	295.4	0.409	9.292	0.5%
Sed-337-C120-0-0.5	00	34122-209	5.73		0.0175	0.1	mg/L as N	06/17/20 0945	06/23/20 1113	22.1	6.87	20.5	5.73	295.3	0.417	9.293	0.3%
Sed-339-C120-0-0.5	00	34122-210	0.3		0.0019	0.1	mg/L as N	06/17/20 0945	06/23/20 1115	21.8	7.19	20.3	0.3	295.0	0.413	9.293	0.6%
Laboratory Control	07	34122-300	0.54		0.0033	0.1	mg/L as N	06/24/20 0920	06/29/20 1514	20.4	7.22	19.5	0.54	293.6	0.396	9.291	0.6%
Sed-321-C120-0-0.5	07	34122-301	1.53		0.0024	0.1	mg/L as N	06/24/20 0920	06/29/20 1515	20.3	6.63	19.6	1.53	293.5	0.398	9.291	0.2%
Sed-322-C120-0-0.5	07	34122-302	2.32		0.0027	0.1	mg/L as N	06/24/20 0920	06/29/20 1515	20.3	6.50	19.8	2.32	293.5	0.403	9.292	0.1%
Sed-323-C120-0-0.5	07	34122-303	0.61		0.0017	0.1	mg/L as N	06/24/20 0920	06/29/20 1516	20.1	6.89	19.5	0.61	293.3	0.396	9.291	0.3%
Sed-324-C120-0-0.5	07	34122-304	0.95		0.0029	0.1	mg/L as N	06/24/20 0920	06/29/20 1517	19.9	6.94	19.6	0.95	293.1	0.398	9.291	0.3%
Sed-325-C120-0-0.5	07	34122-305	0.49		0.0038	0.1	mg/L as N	06/24/20 0920	06/29/20 1518	19.6	7.35	19.5	0.49	292.8	0.396	9.291	0.8%
Sed-331-C120-0-0.5	07	34122-306	6.51		0.0046	0.1	mg/L as N	06/24/20 0920	06/29/20 1519	20.3	6.28	17.8	6.51	293.5	0.361	9.287	0.1%
Sed-333-C120-0-0.5	07	34122-307	0.42		0.0032	0.1	mg/L as N	06/24/20 0920	06/29/20 1520	20.2	7.33	19.7	0.42	293.4	0.400	9.291	0.8%
Sed-335-C120-0-0.5	07	34122-308	0.21		0.0010	0.1	mg/L as N	06/24/20 0920	06/29/20 1522	20.3	7.13	19.5	0.21	293.5	0.396	9.291	0.5%
Sed-337-C120-0-0.5	07	34122-309	2.53		0.0051	0.1	mg/L as N	06/24/20 0920	06/29/20 1523	19.7	6.76	19.6	2.53	292.9	0.398	9.291	0.2%

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation

TASK: Pore Water Ammonia Summary
METHOD: SM 4500-NH3 G

			Ammonia (mg/L)							L	M	N	O	P	Q	R	S
										temp	pH	salinity	Tot NH3	Temp	I	pKa	F_{NH3}
Sample ID	**Day**	**Lab Code**	**Total**	**Qual**	**Unionized**	**QLimit**	**Units**	**Sampled**	**Analyzed**	(°C)	(SU)	(ppt)	(mg/L)	(°K)			(%)
Sed-339-C120-0-0.5	07	34122-310	0.13		0.0010	0.1	mg/L as N	06/24/20 0920	06/29/20 1524	19.9	7.33	19.4	0.13	293.1	0.394	9.291	0.8%
Laboratory Control	14	34122-400	0.52		0.0049	0.1	mg/L as N	07/01/20 1030	07/07/20 1330	20.5	7.41	19.4	0.52	293.7	0.394	9.291	0.9%
Sed-321-C120-0-0.5	14	34122-401	1.13		0.0012	0.1	mg/L as N	07/01/20 1030	07/07/20 1334	20.6	6.46	19.4	1.13	293.8	0.394	9.291	0.1%
Sed-322-C120-0-0.5	14	34122-402	1.65		0.0026	0.1	mg/L as N	07/01/20 1030	07/07/20 1335	20.2	6.64	19.6	1.65	293.4	0.398	9.291	0.2%
Sed-323-C120-0-0.5	14	34122-403	0.58		0.0013	0.1	mg/L as N	07/01/20 1030	07/07/20 1336	19.3	6.84	20.7	0.58	292.5	0.421	9.294	0.2%
Sed-324-C120-0-0.5	14	34122-404	0.49		0.0015	0.1	mg/L as N	07/01/20 1030	07/07/20 1337	20.4	6.93	19.5	0.49	293.6	0.396	9.291	0.3%
Sed-325-C120-0-0.5	14	34122-405	0.31		0.0042	0.1	mg/L as N	07/01/20 1030	07/07/20 1338	20.4	7.57	19.0	0.31	293.6	0.386	9.290	1.3%
Sed-331-C120-0-0.5	14	34122-406	10.3		0.0082	0.1	mg/L as N	07/01/20 1030	07/07/20 1338	20.6	6.33	18.8	10.3	293.8	0.382	9.289	0.1%
Sed-333-C120-0-0.5	14	34122-407	0.2		0.0016	0.1	mg/L as N	07/01/20 1030	07/07/20 1339	20.7	7.34	19.5	0.2	293.9	0.396	9.291	0.8%
Sed-335-C120-0-0.5	14	34122-408	0.24		0.0018	0.1	mg/L as N	07/01/20 1030	07/07/20 1340	20.9	7.30	19.1	0.24	294.1	0.388	9.290	0.8%
Sed-337-C120-0-0.5	14	34122-409	1.55		0.0078	0.1	mg/L as N	07/01/20 1030	07/07/20 1343	20.4	7.14	19.3	1.55	293.6	0.392	9.290	0.5%
Sed-339-C120-0-0.5	14	34122-410	0.15		0.0016	0.1	mg/L as N	07/01/20 1030	07/07/20 1344	20.6	7.47	18.4	0.15	293.8	0.374	9.288	1.1%
Laboratory Control	21	34122-500	1.48		0.0194	0.1	mg/L as N	07/08/20 0930	07/09/20 1512	21.9	7.51	19.8	1.48	295.1	0.403	9.292	1.3%
Sed-321-C120-0-0.5	21	34122-501	2.24		0.0026	0.1	mg/L as N	07/08/20 0930	07/09/20 1513	21.6	6.46	19.5	2.24	294.8	0.396	9.291	0.1%
Sed-322-C120-0-0.5	21	34122-502	0.86		0.0020	0.1	mg/L as N	07/08/20 0930	07/09/20 1522	21.9	6.75	19.8	0.86	295.1	0.403	9.292	0.2%
Sed-323-C120-0-0.5	21	34122-503	0.62		0.0019	0.1	mg/L as N	07/08/20 0930	07/09/20 1523	21.5	6.89	19.8	0.62	294.7	0.403	9.292	0.3%
Sed-324-C120-0-0.5	21	34122-504	0.32		0.0019	0.1	mg/L as N	07/08/20 0930	07/09/20 1524	21.8	7.16	19.9	0.32	295.0	0.405	9.292	0.6%
Sed-325-C120-0-0.5	21	34122-505	0.2		0.0022	0.1	mg/L as N	07/08/20 0930	07/09/20 1525	21.7	7.44	19.8	0.2	294.9	0.403	9.292	1.1%
Sed-331-C120-0-0.5	21	34122-506	7.62		0.0083	0.1	mg/L as N	07/08/20 0930	07/09/20 1526	21.7	6.43	19.1	7.62	294.9	0.388	9.290	0.1%
Sed-333-C120-0-0.5	21	34122-507	0.23		0.0017	0.1	mg/L as N	07/08/20 0930	07/09/20 1526	22.2	7.26	19.8	0.23	295.4	0.403	9.292	0.8%
Sed-335-C120-0-0.5	21	34122-508	0.38		0.0024	0.1	mg/L as N	07/08/20 0930	07/09/20 1527	22.1	7.18	19.7	0.38	295.3	0.400	9.291	0.6%
Sed-337-C120-0-0.5	21	34122-509	1.18		0.0081	0.1	mg/L as N	07/08/20 0930	07/09/20 1528	22.1	7.22	19.8	1.18	295.3	0.403	9.292	0.7%
Sed-339-C120-0-0.5	21	34122-510	ND		0.0017	0.1	mg/L as N	07/08/20 0930	07/09/20 1531	22.0	7.63	18.7	0.1	295.2	0.380	9.289	1.7%
Laboratory Control	28	34122-600	1.9		0.0370	0.1	mg/L as N	07/15/20 0900	07/15/20 1402	22.4	7.67	20.1	1.9	295.6	0.409	9.292	1.9%
Sed-321-C120-0-0.5	28	34122-601	4.02		0.0089	0.1	mg/L as N	07/15/20 0900	07/15/20 1403	22.6	6.71	19.8	4.02	295.8	0.403	9.292	0.2%
Sed-322-C120-0-0.5	28	34122-602	5.1		0.0139	0.1	mg/L as N	07/15/20 0900	07/15/20 1404	22.6	6.80	19.7	5.1	295.8	0.400	9.291	0.3%
Sed-323-C120-0-0.5	28	34122-603	1.18		0.0033	0.1	mg/L as N	07/15/20 0900	07/15/20 1404	22.7	6.81	20.3	1.18	295.9	0.413	9.293	0.3%
Sed-324-C120-0-0.5	28	34122-604	0.28		0.0023	0.1	mg/L as N	07/15/20 0900	07/15/20 1405	22.4	7.29	20.2	0.28	295.6	0.411	9.293	0.8%
Sed-325-C120-0-0.5	28	34122-605	0.26		0.0025	0.1	mg/L as N	07/15/20 0900	07/15/20 1406	22.3	7.36	20.1	0.26	295.5	0.409	9.292	1.0%
Sed-331-C120-0-0.5	28	34122-606	5.26		0.0118	0.1	mg/L as N	07/15/20 0900	07/15/20 1407	22.5	6.72	19.4	5.26	295.7	0.394	9.291	0.2%
Sed-333-C120-0-0.5	28	34122-607	0.25		0.0023	0.1	mg/L as N	07/15/20 0900	07/15/20 1408	22.9	7.32	20.0	0.25	296.1	0.407	9.292	0.9%
Sed-335-C120-0-0.5	28	34122-608	0.48		0.0029	0.1	mg/L as N	07/15/20 0900	07/15/20 1410	22.9	7.14	20.0	0.48	296.1	0.407	9.292	0.6%
Sed-337-C120-0-0.5	28	34122-609	1.58		0.0143	0.1	mg/L as N	07/15/20 0900	07/15/20 1411	22.8	7.32	20.1	1.58	296.0	0.409	9.292	0.9%

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation

TASK: Pore Water Ammonia Summary
METHOD: SM 4500-NH3 G

			Ammonia (mg/L)							L	M	N	O	P	Q	R	S
Sample ID	Day	Lab Code	Total	Qual	Unionized	QLimit	Units	Sampled	Analyzed	temp (°C)	pH (SU)	salinity (ppt)	Tot NH3 (mg/L)	Temp (°K)	I	pKa	F_{NH3} (%)
Sed-339-C120-0-0.5	28	34122-610	ND		0.0014	0.1	mg/L as N	07/15/20 0900	07/15/20 1412	22.3	7.52	20.1	0.1	295.5	0.409	9.292	1.4%

Notes:

Attachment 2 - Formulas Used to Derive Un-Ionized Ammonia (UIA) Fractions and USEPA Ammonia Criteria (Engle 2010) Consistent with USEPA AWQC (1989) and Whitfield (1974).

Where: I = Ionic Strength (19.9273*N11)/(1000-1.005109*N11)

pKa = ionization constant of ammonium ion in aqueous saline solution (+9.245+0.116*Q11)

F_{NH3} = fraction of UIA (+1/(1+10^(R11+0.0324*(298-P11)+((0.0415*1)/P11)-M11)))

Tot NH3 = total ammonia, or QLimit if ND

pressure in F_{NH3} assumed to be 1 atm

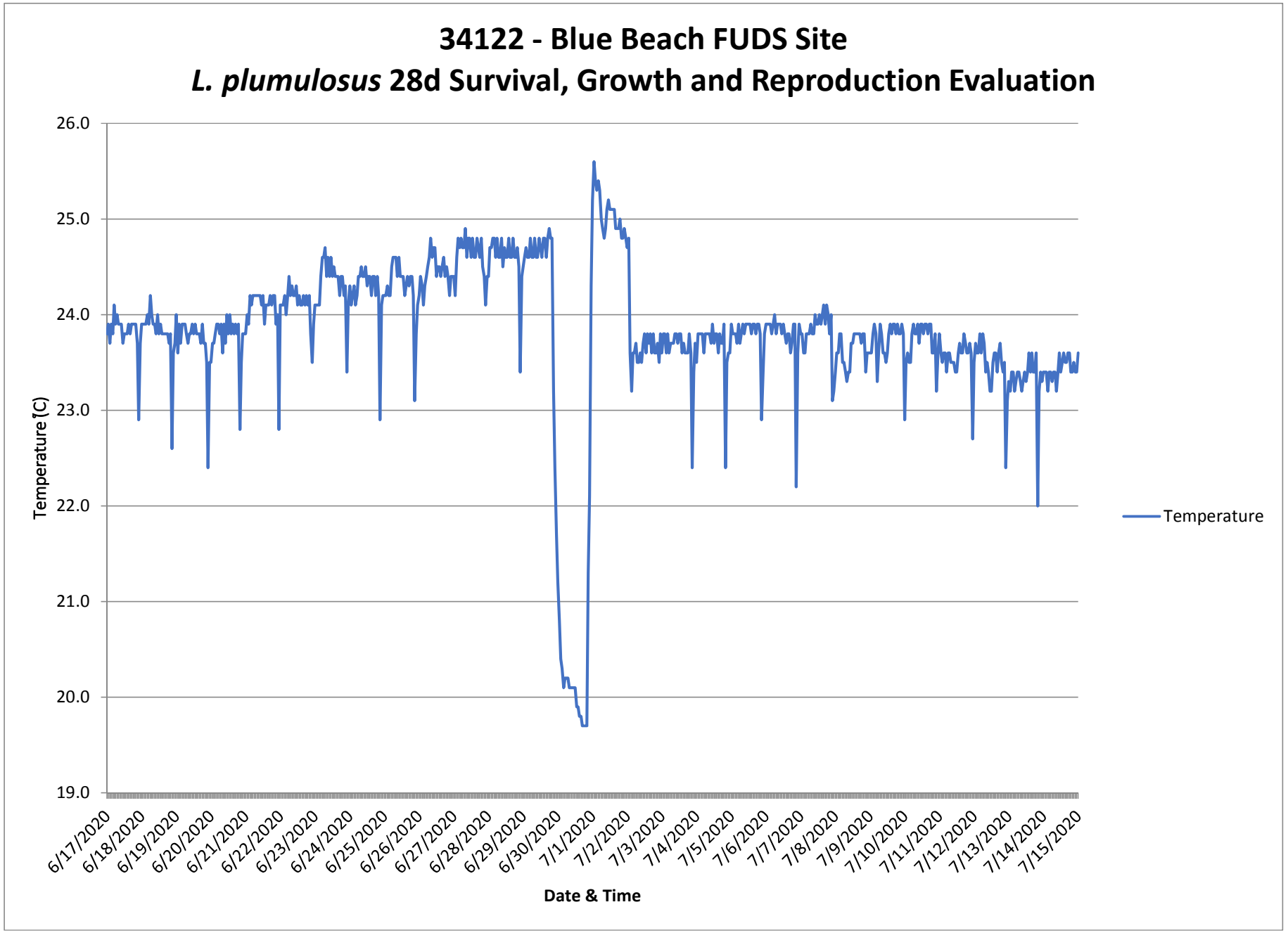
STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Sediment Evaluation

TASK: 20 ppt Laboratory Seawater Ammonia
METHOD: SM 4500-NH3 G

Sample ID	Day	Lab Code	Total NH3 mg/L	Qual	QLimit	Units	Sampled	Analyzed
Lp 20 PPT Day 00 OW	00	34122-222	0.21		0.1	mg/L as N	06/17/20 0945	06/23/20 1127
Lp 20 PPT Day 07 OW	07	34122-322	ND		0.1	mg/L as N	06/24/20 0920	06/29/20 1543
Lp 20 PPT Day 14 OW	14	34122-422	0.15		0.1	mg/L as N	07/01/20 1030	07/07/20 1400
Lp 20 PPT Day 21 OW	21	34122-522	ND		0.1	mg/L as N	07/08/20 0930	07/09/20 1515
Lp 20 PPT Day 28 OW	28	34122-622	ND		0.1	mg/L as N	07/15/20 0900	07/15/20 1428

28 day *Leptocheirus plumulosus* Survival, Growth and Reproduction Sediment Evaluation

Hourly Temperature Data


34122 - Blue Beach FUDS Site
L. plumulosus 28d Survival, Growth and Reproduction Evaluation
Temperature (C)
26.0
25.0
24.0
23.0
22.0
21.0
20.0
19.0
6/17/2020
6/18/2020
6/19/2020
6/20/2020
6/21/2020
6/22/2020
6/23/2020
6/24/2020
6/25/2020
6/26/2020
6/27/2020
6/28/2020
6/29/2020
6/30/2020
7/1/2020
7/2/2020
7/3/2020
7/4/2020
7/5/2020
7/6/2020
7/7/2020
7/8/2020
7/9/2020
7/10/2020
7/11/2020
7/12/2020
7/13/2020
7/14/2020
7/15/2020
Date & Time
Temperature

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
1	6/17/2020	12:53:16 PM	23.8
2	6/17/2020	1:53:16 PM	23.9
3	6/17/2020	2:53:16 PM	23.7
4	6/17/2020	3:53:16 PM	23.9
5	6/17/2020	4:53:16 PM	23.8
6	6/17/2020	5:53:16 PM	24.1
7	6/17/2020	6:53:16 PM	23.9
8	6/17/2020	7:53:16 PM	24.0
9	6/17/2020	8:53:16 PM	23.9
10	6/17/2020	9:53:16 PM	23.9
11	6/17/2020	10:53:16 PM	23.9
12	6/17/2020	11:53:16 PM	23.7
13	6/18/2020	12:53:16 AM	23.8
14	6/18/2020	1:53:16 AM	23.8
15	6/18/2020	2:53:16 AM	23.8
16	6/18/2020	3:53:16 AM	23.9
17	6/18/2020	4:53:16 AM	23.8
18	6/18/2020	5:53:16 AM	23.9
19	6/18/2020	6:53:16 AM	23.9
20	6/18/2020	7:53:16 AM	23.9
21	6/18/2020	8:53:16 AM	23.9
22	6/18/2020	9:53:16 AM	23.7
23	6/18/2020	10:53:16 AM	22.9
24	6/18/2020	11:53:16 AM	23.7
25	6/18/2020	12:53:16 PM	23.9
26	6/18/2020	1:53:16 PM	23.9
27	6/18/2020	2:53:16 PM	23.9
28	6/18/2020	3:53:16 PM	23.9
29	6/18/2020	4:53:16 PM	24.0
30	6/18/2020	5:53:16 PM	23.9
31	6/18/2020	6:53:16 PM	24.2
32	6/18/2020	7:53:16 PM	24.0
33	6/18/2020	8:53:16 PM	23.9
34	6/18/2020	9:53:16 PM	23.9
35	6/18/2020	10:53:16 PM	23.8

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
36	6/18/2020	11:53:16 PM	24.0
37	6/19/2020	12:53:16 AM	23.8
38	6/19/2020	1:53:16 AM	23.9
39	6/19/2020	2:53:16 AM	23.8
40	6/19/2020	3:53:16 AM	23.8
41	6/19/2020	4:53:16 AM	23.8
42	6/19/2020	5:53:16 AM	23.8
43	6/19/2020	6:53:16 AM	23.8
44	6/19/2020	7:53:16 AM	23.7
45	6/19/2020	8:53:16 AM	23.8
46	6/19/2020	9:53:16 AM	22.6
47	6/19/2020	10:53:16 AM	23.6
48	6/19/2020	11:53:16 AM	23.7
49	6/19/2020	12:53:16 PM	24.0
50	6/19/2020	1:53:16 PM	23.6
51	6/19/2020	2:53:16 PM	23.9
52	6/19/2020	3:53:16 PM	23.7
53	6/19/2020	4:53:16 PM	23.9
54	6/19/2020	5:53:16 PM	23.9
55	6/19/2020	6:53:16 PM	23.9
56	6/19/2020	7:53:16 PM	23.8
57	6/19/2020	8:53:16 PM	23.7
58	6/19/2020	9:53:16 PM	23.8
59	6/19/2020	10:53:16 PM	23.8
60	6/19/2020	11:53:16 PM	23.9
61	6/20/2020	12:53:16 AM	23.8
62	6/20/2020	1:53:16 AM	23.9
63	6/20/2020	2:53:16 AM	23.8
64	6/20/2020	3:53:16 AM	23.8
65	6/20/2020	4:53:16 AM	23.8
66	6/20/2020	5:53:16 AM	23.7
67	6/20/2020	6:53:16 AM	23.9
68	6/20/2020	7:53:16 AM	23.7
69	6/20/2020	8:53:16 AM	23.7
70	6/20/2020	9:53:16 AM	23.5

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
71	6/20/2020	10:53:16 AM	22.4
72	6/20/2020	11:53:16 AM	23.5
73	6/20/2020	12:53:16 PM	23.5
74	6/20/2020	1:53:16 PM	23.7
75	6/20/2020	2:53:16 PM	23.7
76	6/20/2020	3:53:16 PM	23.8
77	6/20/2020	4:53:16 PM	23.9
78	6/20/2020	5:53:16 PM	23.9
79	6/20/2020	6:53:16 PM	23.8
80	6/20/2020	7:53:16 PM	23.9
81	6/20/2020	8:53:16 PM	23.6
82	6/20/2020	9:53:16 PM	23.9
83	6/20/2020	10:53:16 PM	23.7
84	6/20/2020	11:53:16 PM	24.0
85	6/21/2020	12:53:16 AM	23.8
86	6/21/2020	1:53:16 AM	24.0
87	6/21/2020	2:53:16 AM	23.8
88	6/21/2020	3:53:16 AM	23.9
89	6/21/2020	4:53:16 AM	23.8
90	6/21/2020	5:53:16 AM	23.9
91	6/21/2020	6:53:16 AM	23.8
92	6/21/2020	7:53:16 AM	23.9
93	6/21/2020	8:53:16 AM	22.8
94	6/21/2020	9:53:16 AM	23.5
95	6/21/2020	10:53:16 AM	23.8
96	6/21/2020	11:53:16 AM	23.8
97	6/21/2020	12:53:16 PM	23.8
98	6/21/2020	1:53:16 PM	24.0
99	6/21/2020	2:53:16 PM	23.9
100	6/21/2020	3:53:16 PM	24.2
101	6/21/2020	4:53:16 PM	24.1
102	6/21/2020	5:53:16 PM	24.2
103	6/21/2020	6:53:16 PM	24.2
104	6/21/2020	7:53:16 PM	24.2
105	6/21/2020	8:53:16 PM	24.2

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
106	6/21/2020	9:53:16 PM	24.2
107	6/21/2020	10:53:16 PM	24.2
108	6/21/2020	11:53:16 PM	24.1
109	6/22/2020	12:53:16 AM	24.2
110	6/22/2020	1:53:16 AM	23.9
111	6/22/2020	2:53:16 AM	24.1
112	6/22/2020	3:53:16 AM	24.1
113	6/22/2020	4:53:16 AM	24.1
114	6/22/2020	5:53:16 AM	24.2
115	6/22/2020	6:53:16 AM	24.1
116	6/22/2020	7:53:16 AM	24.2
117	6/22/2020	8:53:16 AM	24.2
118	6/22/2020	9:53:16 AM	23.9
119	6/22/2020	10:53:16 AM	24.0
120	6/22/2020	11:53:16 AM	22.8
121	6/22/2020	12:53:16 PM	24.1
122	6/22/2020	1:53:16 PM	24.1
123	6/22/2020	2:53:16 PM	24.1
124	6/22/2020	3:53:16 PM	24.2
125	6/22/2020	4:53:16 PM	24.0
126	6/22/2020	5:53:16 PM	24.2
127	6/22/2020	6:53:16 PM	24.4
128	6/22/2020	7:53:16 PM	24.2
129	6/22/2020	8:53:16 PM	24.3
130	6/22/2020	9:53:16 PM	24.2
131	6/22/2020	10:53:16 PM	24.2
132	6/22/2020	11:53:16 PM	24.3
133	6/23/2020	12:53:16 AM	24.1
134	6/23/2020	1:53:16 AM	24.2
135	6/23/2020	2:53:16 AM	24.1
136	6/23/2020	3:53:16 AM	24.1
137	6/23/2020	4:53:16 AM	24.2
138	6/23/2020	5:53:16 AM	24.1
139	6/23/2020	6:53:16 AM	24.2
140	6/23/2020	7:53:16 AM	24.1

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
141	6/23/2020	8:53:16 AM	24.2
142	6/23/2020	9:53:16 AM	23.8
143	6/23/2020	10:53:16 AM	23.5
144	6/23/2020	11:53:16 AM	23.9
145	6/23/2020	12:53:16 PM	24.1
146	6/23/2020	1:53:16 PM	24.1
147	6/23/2020	2:53:16 PM	24.1
148	6/23/2020	3:53:16 PM	24.1
149	6/23/2020	4:53:16 PM	24.4
150	6/23/2020	5:53:16 PM	24.6
151	6/23/2020	6:53:16 PM	24.6
152	6/23/2020	7:53:16 PM	24.7
153	6/23/2020	8:53:16 PM	24.4
154	6/23/2020	9:53:16 PM	24.6
155	6/23/2020	10:53:16 PM	24.4
156	6/23/2020	11:53:16 PM	24.6
157	6/24/2020	12:53:16 AM	24.4
158	6/24/2020	1:53:16 AM	24.5
159	6/24/2020	2:53:16 AM	24.4
160	6/24/2020	3:53:16 AM	24.4
161	6/24/2020	4:53:16 AM	24.4
162	6/24/2020	5:53:16 AM	24.2
163	6/24/2020	6:53:16 AM	24.4
164	6/24/2020	7:53:16 AM	24.4
165	6/24/2020	8:53:16 AM	24.2
166	6/24/2020	9:53:16 AM	24.3
167	6/24/2020	10:53:16 AM	23.4
168	6/24/2020	11:53:16 AM	24.1
169	6/24/2020	12:53:16 PM	24.3
170	6/24/2020	1:53:16 PM	24.1
171	6/24/2020	2:53:16 PM	24.2
172	6/24/2020	3:53:16 PM	24.3
173	6/24/2020	4:53:16 PM	24.1
174	6/24/2020	5:53:16 PM	24.2
175	6/24/2020	6:53:16 PM	24.4

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
176	6/24/2020	7:53:16 PM	24.4
177	6/24/2020	8:53:16 PM	24.5
178	6/24/2020	9:53:16 PM	24.4
179	6/24/2020	10:53:16 PM	24.4
180	6/24/2020	11:53:16 PM	24.5
181	6/25/2020	12:53:16 AM	24.3
182	6/25/2020	1:53:16 AM	24.4
183	6/25/2020	2:53:16 AM	24.4
184	6/25/2020	3:53:16 AM	24.2
185	6/25/2020	4:53:16 AM	24.4
186	6/25/2020	5:53:16 AM	24.4
187	6/25/2020	6:53:16 AM	24.2
188	6/25/2020	7:53:16 AM	24.4
189	6/25/2020	8:53:16 AM	24.2
190	6/25/2020	9:53:16 AM	22.9
191	6/25/2020	10:53:16 AM	24.1
192	6/25/2020	11:53:16 AM	24.2
193	6/25/2020	12:53:16 PM	24.2
194	6/25/2020	1:53:16 PM	24.2
195	6/25/2020	2:53:16 PM	24.3
196	6/25/2020	3:53:16 PM	24.2
197	6/25/2020	4:53:16 PM	24.2
198	6/25/2020	5:53:16 PM	24.5
199	6/25/2020	6:53:16 PM	24.6
200	6/25/2020	7:53:16 PM	24.6
201	6/25/2020	8:53:16 PM	24.6
202	6/25/2020	9:53:16 PM	24.4
203	6/25/2020	10:53:16 PM	24.6
204	6/25/2020	11:53:16 PM	24.4
205	6/26/2020	12:53:16 AM	24.4
206	6/26/2020	1:53:16 AM	24.4
207	6/26/2020	2:53:16 AM	24.2
208	6/26/2020	3:53:16 AM	24.3
209	6/26/2020	4:53:16 AM	24.4
210	6/26/2020	5:53:16 AM	24.3

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
211	6/26/2020	6:53:16 AM	24.4
212	6/26/2020	7:53:16 AM	24.4
213	6/26/2020	8:53:16 AM	24.2
214	6/26/2020	9:53:16 AM	23.1
215	6/26/2020	10:53:16 AM	23.8
216	6/26/2020	11:53:16 AM	24.1
217	6/26/2020	12:53:16 PM	24.2
218	6/26/2020	1:53:16 PM	24.4
219	6/26/2020	2:53:16 PM	24.3
220	6/26/2020	3:53:16 PM	24.1
221	6/26/2020	4:53:16 PM	24.3
222	6/26/2020	5:53:16 PM	24.4
223	6/26/2020	6:53:16 PM	24.5
224	6/26/2020	7:53:16 PM	24.6
225	6/26/2020	8:53:16 PM	24.8
226	6/26/2020	9:53:16 PM	24.6
227	6/26/2020	10:53:16 PM	24.7
228	6/26/2020	11:53:16 PM	24.7
229	6/27/2020	12:53:16 AM	24.4
230	6/27/2020	1:53:16 AM	24.5
231	6/27/2020	2:53:16 AM	24.5
232	6/27/2020	3:53:16 AM	24.4
233	6/27/2020	4:53:16 AM	24.5
234	6/27/2020	5:53:16 AM	24.6
235	6/27/2020	6:53:16 AM	24.4
236	6/27/2020	7:53:16 AM	24.5
237	6/27/2020	8:53:16 AM	24.4
238	6/27/2020	9:53:16 AM	24.2
239	6/27/2020	10:53:16 AM	24.4
240	6/27/2020	11:53:16 AM	24.4
241	6/27/2020	12:53:16 PM	24.4
242	6/27/2020	1:53:16 PM	24.2
243	6/27/2020	2:53:16 PM	24.6
244	6/27/2020	3:53:16 PM	24.8
245	6/27/2020	4:53:16 PM	24.7

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
246	6/27/2020	5:53:16 PM	24.8
247	6/27/2020	6:53:16 PM	24.7
248	6/27/2020	7:53:16 PM	24.7
249	6/27/2020	8:53:16 PM	24.9
250	6/27/2020	9:53:16 PM	24.6
251	6/27/2020	10:53:16 PM	24.8
252	6/27/2020	11:53:16 PM	24.8
253	6/28/2020	12:53:16 AM	24.6
254	6/28/2020	1:53:16 AM	24.8
255	6/28/2020	2:53:16 AM	24.6
256	6/28/2020	3:53:16 AM	24.6
257	6/28/2020	4:53:16 AM	24.8
258	6/28/2020	5:53:16 AM	24.7
259	6/28/2020	6:53:16 AM	24.6
260	6/28/2020	7:53:16 AM	24.8
261	6/28/2020	8:53:16 AM	24.5
262	6/28/2020	9:53:16 AM	24.4
263	6/28/2020	10:53:16 AM	24.1
264	6/28/2020	11:53:16 AM	24.4
265	6/28/2020	12:53:16 PM	24.4
266	6/28/2020	1:53:16 PM	24.7
267	6/28/2020	2:53:16 PM	24.7
268	6/28/2020	3:53:16 PM	24.8
269	6/28/2020	4:53:16 PM	24.8
270	6/28/2020	5:53:16 PM	24.6
271	6/28/2020	6:53:16 PM	24.8
272	6/28/2020	7:53:16 PM	24.6
273	6/28/2020	8:53:16 PM	24.6
274	6/28/2020	9:53:16 PM	24.8
275	6/28/2020	10:53:16 PM	24.5
276	6/28/2020	11:53:16 PM	24.7
277	6/29/2020	12:53:16 AM	24.6
278	6/29/2020	1:53:16 AM	24.6
279	6/29/2020	2:53:16 AM	24.8
280	6/29/2020	3:53:16 AM	24.6

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
281	6/29/2020	4:53:16 AM	24.6
282	6/29/2020	5:53:16 AM	24.8
283	6/29/2020	6:53:16 AM	24.6
284	6/29/2020	7:53:16 AM	24.6
285	6/29/2020	8:53:16 AM	24.7
286	6/29/2020	9:53:16 AM	24.5
287	6/29/2020	10:53:16 AM	23.4
288	6/29/2020	11:53:16 AM	24.4
289	6/29/2020	12:53:16 PM	24.5
290	6/29/2020	1:53:16 PM	24.6
291	6/29/2020	2:53:16 PM	24.7
292	6/29/2020	3:53:16 PM	24.6
293	6/29/2020	4:53:16 PM	24.6
294	6/29/2020	5:53:16 PM	24.8
295	6/29/2020	6:53:16 PM	24.6
296	6/29/2020	7:53:16 PM	24.6
297	6/29/2020	8:53:16 PM	24.8
298	6/29/2020	9:53:16 PM	24.6
299	6/29/2020	10:53:16 PM	24.6
300	6/29/2020	11:53:16 PM	24.8
301	6/30/2020	12:53:16 AM	24.7
302	6/30/2020	1:53:16 AM	24.6
303	6/30/2020	2:53:16 AM	24.8
304	6/30/2020	3:53:16 AM	24.8
305	6/30/2020	4:53:16 AM	24.6
306	6/30/2020	5:53:16 AM	24.8
307	6/30/2020	6:53:16 AM	24.9
308	6/30/2020	7:53:16 AM	24.8
309	6/30/2020	8:53:16 AM	24.8
310	6/30/2020	9:53:16 AM	23.2
311	6/30/2020	10:53:16 AM	22.4
312	6/30/2020	11:53:16 AM	21.7
313	6/30/2020	12:53:16 PM	21.2
314	6/30/2020	1:53:16 PM	20.8
315	6/30/2020	2:53:16 PM	20.4

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
316	6/30/2020	3:53:16 PM	20.3
317	6/30/2020	4:53:16 PM	20.1
318	6/30/2020	5:53:16 PM	20.2
319	6/30/2020	6:53:16 PM	20.2
320	6/30/2020	7:53:16 PM	20.2
321	6/30/2020	8:53:16 PM	20.1
322	6/30/2020	9:53:16 PM	20.1
323	6/30/2020	10:53:16 PM	20.1
324	6/30/2020	11:53:16 PM	20.1
325	7/1/2020	12:53:16 AM	20.1
326	7/1/2020	1:53:16 AM	19.9
327	7/1/2020	2:53:16 AM	19.9
328	7/1/2020	3:53:16 AM	19.8
329	7/1/2020	4:53:16 AM	19.8
330	7/1/2020	5:53:16 AM	19.7
331	7/1/2020	6:53:16 AM	19.7
332	7/1/2020	7:53:16 AM	19.7
333	7/1/2020	8:53:16 AM	19.7
334	7/1/2020	9:53:16 AM	21.3
335	7/1/2020	10:53:16 AM	22.1
336	7/1/2020	11:53:16 AM	24.3
337	7/1/2020	12:53:16 PM	25.2
338	7/1/2020	1:53:16 PM	25.6
339	7/1/2020	2:53:16 PM	25.4
340	7/1/2020	3:53:16 PM	25.3
341	7/1/2020	4:53:16 PM	25.4
342	7/1/2020	5:53:16 PM	25.3
343	7/1/2020	6:53:16 PM	25.0
344	7/1/2020	7:53:16 PM	24.9
345	7/1/2020	8:53:16 PM	24.8
346	7/1/2020	9:53:16 PM	24.9
347	7/1/2020	10:53:16 PM	25.1
348	7/1/2020	11:53:16 PM	25.2
349	7/2/2020	12:53:16 AM	25.1
350	7/2/2020	1:53:16 AM	25.1

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
351	7/2/2020	2:53:16 AM	25.1
352	7/2/2020	3:53:16 AM	25.1
353	7/2/2020	4:53:16 AM	24.9
354	7/2/2020	5:53:16 AM	24.9
355	7/2/2020	6:53:16 AM	24.9
356	7/2/2020	7:53:16 AM	25.0
357	7/2/2020	8:53:16 AM	24.8
358	7/2/2020	9:53:16 AM	24.8
359	7/2/2020	10:53:16 AM	24.9
360	7/2/2020	11:53:16 AM	24.8
361	7/2/2020	12:53:16 PM	24.7
362	7/2/2020	1:53:16 PM	24.8
363	7/2/2020	2:53:16 PM	23.6
364	7/2/2020	3:53:16 PM	23.2
365	7/2/2020	4:53:16 PM	23.6
366	7/2/2020	5:53:16 PM	23.6
367	7/2/2020	6:53:16 PM	23.7
368	7/2/2020	7:53:16 PM	23.5
369	7/2/2020	8:53:16 PM	23.5
370	7/2/2020	9:53:16 PM	23.6
371	7/2/2020	10:53:16 PM	23.5
372	7/2/2020	11:53:16 PM	23.7
373	7/3/2020	12:53:16 AM	23.8
374	7/3/2020	1:53:16 AM	23.6
375	7/3/2020	2:53:16 AM	23.8
376	7/3/2020	3:53:16 AM	23.7
377	7/3/2020	4:53:16 AM	23.8
378	7/3/2020	5:53:16 AM	23.6
379	7/3/2020	6:53:16 AM	23.8
380	7/3/2020	7:53:16 AM	23.6
381	7/3/2020	8:53:16 AM	23.6
382	7/3/2020	9:53:16 AM	23.7
383	7/3/2020	10:53:16 AM	23.5
384	7/3/2020	11:53:16 AM	23.8
385	7/3/2020	12:53:16 PM	23.6

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
386	7/3/2020	1:53:16 PM	23.8
387	7/3/2020	2:53:16 PM	23.8
388	7/3/2020	3:53:16 PM	23.6
389	7/3/2020	4:53:16 PM	23.8
390	7/3/2020	5:53:16 PM	23.6
391	7/3/2020	6:53:16 PM	23.7
392	7/3/2020	7:53:16 PM	23.7
393	7/3/2020	8:53:16 PM	23.7
394	7/3/2020	9:53:16 PM	23.8
395	7/3/2020	10:53:16 PM	23.8
396	7/3/2020	11:53:16 PM	23.7
397	7/4/2020	12:53:16 AM	23.8
398	7/4/2020	1:53:16 AM	23.8
399	7/4/2020	2:53:16 AM	23.6
400	7/4/2020	3:53:16 AM	23.7
401	7/4/2020	4:53:16 AM	23.6
402	7/4/2020	5:53:16 AM	23.6
403	7/4/2020	6:53:16 AM	23.6
404	7/4/2020	7:53:16 AM	23.8
405	7/4/2020	8:53:16 AM	23.6
406	7/4/2020	9:53:16 AM	22.4
407	7/4/2020	10:53:16 AM	23.4
408	7/4/2020	11:53:16 AM	23.7
409	7/4/2020	12:53:16 PM	23.5
410	7/4/2020	1:53:16 PM	23.8
411	7/4/2020	2:53:16 PM	23.8
412	7/4/2020	3:53:16 PM	23.8
413	7/4/2020	4:53:16 PM	23.8
414	7/4/2020	5:53:16 PM	23.6
415	7/4/2020	6:53:16 PM	23.8
416	7/4/2020	7:53:16 PM	23.8
417	7/4/2020	8:53:16 PM	23.8
418	7/4/2020	9:53:16 PM	23.8
419	7/4/2020	10:53:16 PM	23.7
420	7/4/2020	11:53:16 PM	23.9

STUDY: 34122
CLIENT: Mabbett & Associates
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ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
421	7/5/2020	12:53:16 AM	23.7
422	7/5/2020	1:53:16 AM	23.8
423	7/5/2020	2:53:16 AM	23.8
424	7/5/2020	3:53:16 AM	23.6
425	7/5/2020	4:53:16 AM	23.8
426	7/5/2020	5:53:16 AM	23.7
427	7/5/2020	6:53:16 AM	23.7
428	7/5/2020	7:53:16 AM	23.9
429	7/5/2020	8:53:16 AM	22.4
430	7/5/2020	9:53:16 AM	23.5
431	7/5/2020	10:53:16 AM	23.6
432	7/5/2020	11:53:16 AM	23.6
433	7/5/2020	12:53:16 PM	23.9
434	7/5/2020	1:53:16 PM	23.8
435	7/5/2020	2:53:16 PM	23.8
436	7/5/2020	3:53:16 PM	23.8
437	7/5/2020	4:53:16 PM	23.7
438	7/5/2020	5:53:16 PM	23.9
439	7/5/2020	6:53:16 PM	23.7
440	7/5/2020	7:53:16 PM	23.8
441	7/5/2020	8:53:16 PM	23.9
442	7/5/2020	9:53:16 PM	23.8
443	7/5/2020	10:53:16 PM	23.9
444	7/5/2020	11:53:16 PM	23.9
445	7/6/2020	12:53:16 AM	23.9
446	7/6/2020	1:53:16 AM	23.9
447	7/6/2020	2:53:16 AM	23.8
448	7/6/2020	3:53:16 AM	23.9
449	7/6/2020	4:53:16 AM	23.9
450	7/6/2020	5:53:16 AM	23.8
451	7/6/2020	6:53:16 AM	23.9
452	7/6/2020	7:53:16 AM	23.9
453	7/6/2020	8:53:16 AM	23.8
454	7/6/2020	9:53:16 AM	22.9
455	7/6/2020	10:53:16 AM	23.4

STUDY: 34122
CLIENT: Mabbett & Associates
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ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
456	7/6/2020	11:53:16 AM	23.8
457	7/6/2020	12:53:16 PM	23.9
458	7/6/2020	1:53:16 PM	23.9
459	7/6/2020	2:53:16 PM	23.9
460	7/6/2020	3:53:16 PM	23.9
461	7/6/2020	4:53:16 PM	23.8
462	7/6/2020	5:53:16 PM	23.9
463	7/6/2020	6:53:16 PM	24.0
464	7/6/2020	7:53:16 PM	23.8
465	7/6/2020	8:53:16 PM	23.9
466	7/6/2020	9:53:16 PM	23.9
467	7/6/2020	10:53:16 PM	23.9
468	7/6/2020	11:53:16 PM	23.8
469	7/7/2020	12:53:16 AM	23.9
470	7/7/2020	1:53:16 AM	23.8
471	7/7/2020	2:53:16 AM	23.7
472	7/7/2020	3:53:16 AM	23.8
473	7/7/2020	4:53:16 AM	23.8
474	7/7/2020	5:53:16 AM	23.6
475	7/7/2020	6:53:16 AM	23.7
476	7/7/2020	7:53:16 AM	23.9
477	7/7/2020	8:53:16 AM	23.9
478	7/7/2020	9:53:16 AM	22.2
479	7/7/2020	10:53:16 AM	23.6
480	7/7/2020	11:53:16 AM	23.9
481	7/7/2020	12:53:16 PM	23.8
482	7/7/2020	1:53:16 PM	23.8
483	7/7/2020	2:53:16 PM	23.6
484	7/7/2020	3:53:16 PM	23.6
485	7/7/2020	4:53:16 PM	23.8
486	7/7/2020	5:53:16 PM	23.8
487	7/7/2020	6:53:16 PM	23.8
488	7/7/2020	7:53:16 PM	23.9
489	7/7/2020	8:53:16 PM	23.8
490	7/7/2020	9:53:16 PM	23.8

STUDY: 34122
CLIENT: Mabbett & Associates
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ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
491	7/7/2020	10:53:16 PM	24.0
492	7/7/2020	11:53:16 PM	23.9
493	7/8/2020	12:53:16 AM	23.9
494	7/8/2020	1:53:16 AM	24.0
495	7/8/2020	2:53:16 AM	23.9
496	7/8/2020	3:53:16 AM	24.0
497	7/8/2020	4:53:16 AM	24.1
498	7/8/2020	5:53:16 AM	23.9
499	7/8/2020	6:53:16 AM	24.1
500	7/8/2020	7:53:16 AM	24.0
501	7/8/2020	8:53:16 AM	23.8
502	7/8/2020	9:53:16 AM	24.0
503	7/8/2020	10:53:16 AM	23.1
504	7/8/2020	11:53:16 AM	23.2
505	7/8/2020	12:53:16 PM	23.4
506	7/8/2020	1:53:16 PM	23.6
507	7/8/2020	2:53:16 PM	23.6
508	7/8/2020	3:53:16 PM	23.8
509	7/8/2020	4:53:16 PM	23.8
510	7/8/2020	5:53:16 PM	23.5
511	7/8/2020	6:53:16 PM	23.5
512	7/8/2020	7:53:16 PM	23.4
513	7/8/2020	8:53:16 PM	23.3
514	7/8/2020	9:53:16 PM	23.4
515	7/8/2020	10:53:16 PM	23.4
516	7/8/2020	11:53:16 PM	23.7
517	7/9/2020	12:53:16 AM	23.7
518	7/9/2020	1:53:16 AM	23.8
519	7/9/2020	2:53:16 AM	23.8
520	7/9/2020	3:53:16 AM	23.8
521	7/9/2020	4:53:16 AM	23.8
522	7/9/2020	5:53:16 AM	23.8
523	7/9/2020	6:53:16 AM	23.7
524	7/9/2020	7:53:16 AM	23.8
525	7/9/2020	8:53:16 AM	23.8

STUDY: 34122
CLIENT: Mabbett & Associates
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ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
526	7/9/2020	9:53:16 AM	23.4
527	7/9/2020	10:53:16 AM	23.6
528	7/9/2020	11:53:16 AM	23.6
529	7/9/2020	12:53:16 PM	23.6
530	7/9/2020	1:53:16 PM	23.6
531	7/9/2020	2:53:16 PM	23.8
532	7/9/2020	3:53:16 PM	23.9
533	7/9/2020	4:53:16 PM	23.8
534	7/9/2020	5:53:16 PM	23.3
535	7/9/2020	6:53:16 PM	23.6
536	7/9/2020	7:53:16 PM	23.9
537	7/9/2020	8:53:16 PM	23.8
538	7/9/2020	9:53:16 PM	23.6
539	7/9/2020	10:53:16 PM	23.6
540	7/9/2020	11:53:16 PM	23.5
541	7/10/2020	12:53:16 AM	23.6
542	7/10/2020	1:53:16 AM	23.8
543	7/10/2020	2:53:16 AM	23.9
544	7/10/2020	3:53:16 AM	23.8
545	7/10/2020	4:53:16 AM	23.9
546	7/10/2020	5:53:16 AM	23.9
547	7/10/2020	6:53:16 AM	23.8
548	7/10/2020	7:53:16 AM	23.9
549	7/10/2020	8:53:16 AM	23.8
550	7/10/2020	9:53:16 AM	23.8
551	7/10/2020	10:53:16 AM	23.9
552	7/10/2020	11:53:16 AM	23.8
553	7/10/2020	12:53:16 PM	22.9
554	7/10/2020	1:53:16 PM	23.5
555	7/10/2020	2:53:16 PM	23.6
556	7/10/2020	3:53:16 PM	23.5
557	7/10/2020	4:53:16 PM	23.5
558	7/10/2020	5:53:16 PM	23.8
559	7/10/2020	6:53:16 PM	23.9
560	7/10/2020	7:53:16 PM	23.8

STUDY: 34122
CLIENT: Mabbett & Associates
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ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
561	7/10/2020	8:53:16 PM	23.8
562	7/10/2020	9:53:16 PM	23.9
563	7/10/2020	10:53:16 PM	23.7
564	7/10/2020	11:53:16 PM	23.9
565	7/11/2020	12:53:16 AM	23.9
566	7/11/2020	1:53:16 AM	23.8
567	7/11/2020	2:53:16 AM	23.9
568	7/11/2020	3:53:16 AM	23.9
569	7/11/2020	4:53:16 AM	23.8
570	7/11/2020	5:53:16 AM	23.9
571	7/11/2020	6:53:16 AM	23.9
572	7/11/2020	7:53:16 AM	23.6
573	7/11/2020	8:53:16 AM	23.6
574	7/11/2020	9:53:16 AM	23.8
575	7/11/2020	10:53:16 AM	23.2
576	7/11/2020	11:53:16 AM	23.6
577	7/11/2020	12:53:16 PM	23.8
578	7/11/2020	1:53:16 PM	23.6
579	7/11/2020	2:53:16 PM	23.5
580	7/11/2020	3:53:16 PM	23.6
581	7/11/2020	4:53:16 PM	23.6
582	7/11/2020	5:53:16 PM	23.4
583	7/11/2020	6:53:16 PM	23.6
584	7/11/2020	7:53:16 PM	23.6
585	7/11/2020	8:53:16 PM	23.5
586	7/11/2020	9:53:16 PM	23.5
587	7/11/2020	10:53:16 PM	23.5
588	7/11/2020	11:53:16 PM	23.4
589	7/12/2020	12:53:16 AM	23.4
590	7/12/2020	1:53:16 AM	23.6
591	7/12/2020	2:53:16 AM	23.7
592	7/12/2020	3:53:16 AM	23.6
593	7/12/2020	4:53:16 AM	23.6
594	7/12/2020	5:53:16 AM	23.8
595	7/12/2020	6:53:16 AM	23.7

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
596	7/12/2020	7:53:16 AM	23.6
597	7/12/2020	8:53:16 AM	23.6
598	7/12/2020	9:53:16 AM	23.7
599	7/12/2020	10:53:16 AM	23.6
600	7/12/2020	11:53:16 AM	22.7
601	7/12/2020	12:53:16 PM	23.5
602	7/12/2020	1:53:16 PM	23.7
603	7/12/2020	2:53:16 PM	23.6
604	7/12/2020	3:53:16 PM	23.6
605	7/12/2020	4:53:16 PM	23.8
606	7/12/2020	5:53:16 PM	23.6
607	7/12/2020	6:53:16 PM	23.8
608	7/12/2020	7:53:16 PM	23.7
609	7/12/2020	8:53:16 PM	23.4
610	7/12/2020	9:53:16 PM	23.5
611	7/12/2020	10:53:16 PM	23.4
612	7/12/2020	11:53:16 PM	23.2
613	7/13/2020	12:53:16 AM	23.2
614	7/13/2020	1:53:16 AM	23.5
615	7/13/2020	2:53:16 AM	23.6
616	7/13/2020	3:53:16 AM	23.6
617	7/13/2020	4:53:16 AM	23.4
618	7/13/2020	5:53:16 AM	23.6
619	7/13/2020	6:53:16 AM	23.7
620	7/13/2020	7:53:16 AM	23.5
621	7/13/2020	8:53:16 AM	23.4
622	7/13/2020	9:53:16 AM	23.5
623	7/13/2020	10:53:16 AM	22.4
624	7/13/2020	11:53:16 AM	23.1
625	7/13/2020	12:53:16 PM	23.3
626	7/13/2020	1:53:16 PM	23.2
627	7/13/2020	2:53:16 PM	23.4
628	7/13/2020	3:53:16 PM	23.4
629	7/13/2020	4:53:16 PM	23.2
630	7/13/2020	5:53:16 PM	23.3

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
631	7/13/2020	6:53:16 PM	23.4
632	7/13/2020	7:53:16 PM	23.4
633	7/13/2020	8:53:16 PM	23.3
634	7/13/2020	9:53:16 PM	23.2
635	7/13/2020	10:53:16 PM	23.3
636	7/13/2020	11:53:16 PM	23.4
637	7/14/2020	12:53:16 AM	23.3
638	7/14/2020	1:53:16 AM	23.4
639	7/14/2020	2:53:16 AM	23.6
640	7/14/2020	3:53:16 AM	23.4
641	7/14/2020	4:53:16 AM	23.6
642	7/14/2020	5:53:16 AM	23.4
643	7/14/2020	6:53:16 AM	23.4
644	7/14/2020	7:53:16 AM	23.6
645	7/14/2020	8:53:16 AM	22.0
646	7/14/2020	9:53:16 AM	23.2
647	7/14/2020	10:53:16 AM	23.4
648	7/14/2020	11:53:16 AM	23.3
649	7/14/2020	12:53:16 PM	23.4
650	7/14/2020	1:53:16 PM	23.4
651	7/14/2020	2:53:16 PM	23.4
652	7/14/2020	3:53:16 PM	23.2
653	7/14/2020	4:53:16 PM	23.4
654	7/14/2020	5:53:16 PM	23.4
655	7/14/2020	6:53:16 PM	23.3
656	7/14/2020	7:53:16 PM	23.4
657	7/14/2020	8:53:16 PM	23.4
658	7/14/2020	9:53:16 PM	23.2
659	7/14/2020	10:53:16 PM	23.4
660	7/14/2020	11:53:16 PM	23.6
661	7/15/2020	12:53:16 AM	23.4
662	7/15/2020	1:53:16 AM	23.5
663	7/15/2020	2:53:16 AM	23.6
664	7/15/2020	3:53:16 AM	23.5
665	7/15/2020	4:53:16 AM	23.5

STUDY: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: *L. plumulosus* 28 Day Survival, Growth and Reproduction Evaluation
TASK: Hourly Temperature Data
Serial Number: ML-9 M35457

Mean:	23.8 °C
Minimum:	19.7 °C
Maximum:	25.6 °C

Reading	Date	Time	Celsius (°C)
666	7/15/2020	5:53:16 AM	23.6
667	7/15/2020	6:53:16 AM	23.6
668	7/15/2020	7:53:16 AM	23.4
669	7/15/2020	8:53:16 AM	23.4
670	7/15/2020	9:53:16 AM	23.5
671	7/15/2020	10:53:16 AM	23.4
672	7/15/2020	11:53:16 AM	23.4
673	7/15/2020	12:53:16 PM	23.6

ASSAY REVIEW CHECKLIST

STUDY#: 34122
CLIENT: Mabbett & Associates
PROJECT: Blue Beach FUDS Site
ASSAY: 28 day L. plumulosus Survival, Growth and Reproduction Evaluation

Analyst Data Review	Date	Initials	Comments
Chains of Custody Complete	07/22/20	JTP	
Sample Receipt Complete	↓	↓	
Organism Culture Sheet(s)			
Bench Sheets Complete (dates, times, initials, etc...)			
Water Quality Data Complete			
Weights Reported			
Assay Acceptability Review	↓	↓	

Technical Report Review	Date	Initials	Comments
Statistical Analysis	7/21/20	NR	
Statistical Analysis Reviewed	7/21/20	MW	
Data Acceptability Review	7/21/20	NR	
Support Documentation			
Temperature Data Logger	07/22/20	JTP	Downloaded.
Daily WQ Data	07/22/20	JTP	Compiled
Overlying and/or Pore Water Chemistry (NH3)	7/21/20	NR	
Other Chemical Analysis Data	NA		
Draft Report	7/23/20	NR	
Report Reviewed	7/28/20		
QA Audit/Review Complete			
Report Printed - PDF	7/29/20	NR	
Report E-mailed / Faxed	7/29/20	NR	
Report Logged Out	↓	↓	

Q:\Forms\QA Forms\ERA\ERA Assay Review Checklist rev0 040819.docx

Andrew J. Moore

Digitally signed by Andrew J. Moore
DN: cn=Andrew J. Moore, o=EnviroSystems-Enthalpy, ou=QA Director, email=andrew.moore@enthalpy.com, c=US
Date: 2019.04.08 16:50:26 -04'00'

Attachment I

Macroinvertebrate Community Results

ATTACHMENT I TABLE 1
BENTHIC INVERTEBRATE COUNTS BY STATION
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Station	Location Group	Collection Date	Phylogenetic group / Genus species	Common name	Number of Individuals	Tolerance Value [a]
Sed-321-C120-0-0.5	Upstream Reference	5/28/2020	Nematoda	round worm	11	5
			Oligochaeta / Enchytraeidae	earthworm	2	10
			Oligochaeta / Tubificid without hair chaetae	tube worm	33	10
			Oligochaeta / Tubificid without hair chaetae	tube worm	3	10
			Oligochaeta / Limnodrilus sp.	tube worm	3	10
			Oligochaeta / Megadrili	earthworm	1	6
			Oligochaeta / Nais sp.	naiad worm	9	8
			Gastropoda / Helisoma sp.	orb snail	2	6
			Isopoda / Caecidotea sp.	water slater	1	8
			Diptera (chironomidae) / Chironomus sp.	midge	2	10
			Diptera (chironomidae) / Limnophyes sp.	midge	1	8
			Diptera (chironomidae) / Micropsectra sp.	midge	4	7
			Diptera / Cecidomyiidae	gall gnat	1	5
			Diptera / Dolichopodidae	long-legged fly	2	4
			Diptera / Ephydridae	shore fly	5	7
			Diptera / Erioptera sp	crane fly	7	4
			Diptera / Molophilus sp.	crane fly	6	4
			Diptera / Tipula sp.	crane fly	1	6
Sed-322-C120-0-0.5	Upstream Reference	5/28/2020	Nematoda	round worm	2	5
			Oligochaeta / tubificid without hair chaetae	tube worm	82	10
			Oligochaeta / Lumbriculus variegatus	earthworm	1	5
			Oligochaeta / Megadrili	earthworm	1	6
			Oligochaeta / Nais sp.	naiad worm	4	8
			Diptera (chironomidae) / Chironomus sp.	midge	1	10
			Diptera (chironomidae) / Orthocladiinae	midge	2	5
			Diptera (chironomidae) / Tanytarsus sp.	midge	2	6
			Diptera / Erioptera sp	crane fly	2	4
			Diptera / Tipula sp.	crane fly	1	6
Sed-323-C120-0-0.5	Upstream Reference	5/28/2020	Nematoda	round worm	2	5
			Oligochaeta / Megadrili	earthworm	62	6
			Oligochaeta / Nais sp.	naiad worm	1	8
			Gastropoda / Hydrobiidae	dusky snail	2	8
			Gastropoda / Helisoma sp.	orb snail	3	6
			Diptera (chironomidae) / Smittia sp.	midge	4	6
			Diptera / Dolichopodidae	long-legged fly	1	4
			Diptera / Ephydridae	shore fly	1	7
			Diptera / Erioptera sp	crane fly	1	4
			Diptera / Molophilus sp.	crane fly	4	4
Sed-324-C120-0-0.5	Upstream Reference	5/28/2020	Nematoda	round worm	2	5
			Oligochaeta / Megadrili	earthworm	19	6
			Gastropoda / Helisoma sp.	orb snail	6	6
			Gastropoda / Hydrobiinae	dusky snail	1	8
			Diptera (chironomidae) / Limnophyes sp.	midge	5	8
			Diptera (chironomidae) / Smittia sp.	midge	5	6
			Diptera / Cecidomyiidae	gall gnat	1	5
			Diptera / Dolichopodidae	long-legged fly	1	4
			Diptera / Ephydridae	shore fly	2	7
Sed-325-C120-0-0.5	Upstream Reference	5/28/2020	Oligochaeta / Enchytraeidae	earthworm	6	10
			Oligochaeta / Megadrili	earthworm	2	6
			Diptera (chironomidae) / Smittia sp.	midge	1	6
			Other Diptera / Dolichopodidae	long-legged fly	1	4
Sed-331-C120-0-0.5	Downstream Site	5/28/2020	Oligochaeta / Aulodrilus sp.	tube worm	3	7
			Oligochaeta / Ilyodrilus templetoni	tube worm	1	10
			Oligochaeta / Limnodrilus sp.	tube worm	46	10
			Bivalvia / Pisidium casertanum	pill clam	9	6
			Isopoda / Caecidotea sp.	water slater	29	8
			Diptera (chironomidae) / Paratendipes albimanus	midge	4	6
			Diptera (chironomidae) / Tanypodinae	midge	1	7

ATTACHMENT I TABLE 1
BENTHIC INVERTEBRATE COUNTS BY STATION
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Station	Location Group	Collection Date	Phylogenetic group / Genus species	Common name	Number of Individuals	Tolerance Value [a]
Sed-333-C120-0-0.5	Downstream Site	5/28/2020	Oligochaeta / Nais sp.	naiad worm	1	8
			Oligochaeta / Paranais littoralis	naid worm	8	10
			Amphipoda / Gammarus sp.	side swimmer	10	6
			Ephemeroptera / Maccaffertium sp.	mayfly	1	3
			Coleoptera / Tropisternus sp.	scavenger beetle	1	5
			Coleoptera / Neoporus sp.	diving beetle	1	5
			Diptera (chironomidae) / Chironomus sp.	midge	6	10
			Diptera (chironomidae) / Micropsectra sp.	midge	29	7
			Diptera (chironomidae) / Orthocladiinae	midge	3	5
			Diptera (chironomidae) / Orthocladius	midge	11	6
			Diptera (chironomidae) / Psectrocladius sp.	midge	20	8
			Diptera / Dasyhelea sp.	sand fly	1	4
			Diptera / Probezzia sp.	sand fly	3	6
Sed-335-C120-0-0.5	Downstream Site	5/28/2020	Oligochaeta / Enchytraeidae	earthworm	2	10
			Oligochaeta / Nais sp.	naiad worm	20	8
			Amphipoda / Gammarus sp.	side swimmer	21	6
			Coleoptera / Enochrus sp.	scavenger beetle	1	5
			Coleoptera / Neoporus sp	diving beetle	1	5
			Diptera (chironomidae) / Cricotopus sp.	midge	1	7
			Diptera (chironomidae) / Orthocladiinae	midge	2	5
			Diptera (chironomidae) / Paratendipes albimanus	midge	1	6
			Diptera (chironomidae) / Tanytarsus sp.	midge	42	6
			Diptera / Culicoides sp.	sand fly	2	10
			Diptera / Probezzia sp.	sand fly	3	6
Sed-337-C120-0-0.5	Downstream Site	5/28/2020	Nematoda	round worm	2	5
			Oligochaeta / Limnodrilus sp.	tube worm	31	10
			Oligochaeta / Paranais littoralis	naid worm	50	10
			Amphipoda / Gammarus sp.	side swimmer	1	6
Sed-339-C120-0-0.5	Downstream Site	5/28/2020	Nematoda	round worm	28	5
			Oligochaeta / Enchytraeidae	earthworm	20	10
			Oligochaeta / tubificid with hair chaetae	tube worm	5	10
			Oligochaeta / Megadrili	earthworm	4	6
			Oligochaeta / Nais sp.	naiad worm	1	8
			Oligochaeta / Paranais littoralis	naid worm	9	10
			Polychaeta / Capatella capitata cplx.	thread worm	1	6
			Polychaeta / Leitoscoloplus sp.	orbiniid worm	2	6
			Polychaeta / Nereidae	clam worm	1	6
			Polychaeta / Polydora cornuta	mud worm	14	6
			Gastropoda / Hydrobiidae	dusky snail	3	8
			Amphipoda / Gammarus sp.	side swimmer	1	6
			Decapoda / Palaemonetes sp.	prawn	2	6
			Diptera (chironomidae) / Orthocladius	midge	1	6
			Diptera / Culicoides sp.	sand fly	2	10

Notes:
Invertebrate counts and tolerance values identified by Normandeau Associates, Inc.

[a] - New York State Department of Environmental Conservation (NYSDEC). 2019. Standard Operating Procedure: Biological Monitoring of Surface Waters in New Sensitive = 0 – 3; Facultative = 4 – 6; Tolerant = 7 – 10.

ATTACHMENT I TABLE 2
BENTHIC INVERTEBRATE COUNTS SED-321
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Benthic Macroinvertebrates collected by Mabbett & Associates from a tributary to to Narragansett Bay near North Kingstown, Rhode Island for a CERCLA-compliant Risk Assessment

Location:	**SED - 321 - C120 - 0 - 05**				
Sample Date:	May 28, 2020				Weighted Tolerance Value (Individual Count x Tolerance Value)
Procedure:	US EPA Rapid Bioassessment Protocol III				
Taxon	Tol.[(1)]	Common Name	Count	Percent	
Nematoda	5	round worm	11	11.7%	55
Oligochaeta					
Enchytraeidae	10	earthworm	2	2.1%	20
imm. tubificid w / hair chaetae	10	tube worm	33	35.1%	330
imm. tubificid w/o hair chaetae	10	tube worm	3	3.2%	30
Limnodrilus sp.	10	tube worm	3	3.2%	30
Megadrili	6	earthworm	1	1.1%	6
Nais sp.	8	naiad worm	9	9.6%	72
Gastropoda					
Helisoma sp.	6	orb snail	2	2.1%	12
Isopoda					
Caecidotea sp.	8	water slater	1	1.1%	8
Diptera (chironomidae)					
Chironomus sp.	10	midge	2	2.1%	20
Limnophyes sp.	8	midge	1	1.1%	8
Micropsectra sp.	7	midge	4	4.3%	28
Other Diptera					
Cecidomyiidae	5	gall gnat	1	1.1%	5
Dolichopodidae	4	long-legged fly	2	2.1%	8
Ephydridae	7	shore fly	5	5.3%	35
Erioptera sp	4	crane fly	7	7.4%	28
Molophilus sp.	4	crane fly	6	6.4%	24
Tipula sp.	6	crane fly	1	1.1%	6
Total Specimens			94	100.0%	
Percent of sample processed			21%		
Sample total (estimate)			439		
Total Taxa			18		
Shannon Diversity (base e)			2.29		
Hilsenhoff Biotic Index			7.7	Metric calculated by AECOM	

(1) Source: NYS DEC, 2019.

ATTACHMENT I TABLE 3
BENTHIC INVERTEBRATE COUNTS SED-322
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Benthic Macroinvertebrates collected by Mabbett & Associates from a tributary to to Narragansett Bay near North Kingstown, Rhode Island for a CERCLA-compliant Risk Assessment

Location:	**SED - 322 - C120 - 0 - 05**				
Sample Date:	May 28, 2020				Weighted Tolerance Value (Individual Count x Tolerance Value)
Procedure:	US EPA Rapid Bioassessment Protocol III				
Taxon	Tol.[(1)]	Common Name	Count	Percent	
Nematoda	5	round worm	2	2.0%	10
Oligochaeta					
imm. tubificid w/o hair chaetae	10	tube worm	82	83.7%	820
Lumbriculus variegatus	5	earthworm	1	1.0%	5
Megadrili	6	earthworm	1	1.0%	6
Nais sp.	8	naiad worm	4	4.1%	32
Diptera (chironomidae)					
Chironomus sp.	10	midge	1	1.0%	10
Orthocladiinae	5	midge	2	2.0%	10
Tanytarsus sp.	6	midge	2	2.0%	12
Other Diptera					
Erioptera sp	4	crane fly	2	2.0%	8
Tipula sp.	6	crane fly	1	1.0%	6
Total Specimens			98	100.0%	
Percent of sample processed			29%		
Sample total (estimate)			343		
Total Taxa			10		
Shannon Diversity (base e)			0.78		
Hilsenhoff Biotic Index			9.4	Metric calculated by AECOM	

(1) Source: NYS DEC, 2019.

ATTACHMENT I TABLE 4
BENTHIC INVERTEBRATE COUNTS SED-323
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Benthic Macroinvertebrates collected by Mabbett & Associates from a tributary to to Narragansett Bay near North Kingstown, Rhode Island for a CERCLA-compliant Risk Assessment

Location:	**SED - 323 - C120 - 0 - 05**				
Sample Date:	May 28, 2020				Weighted Tolerance Value (Individual Count x Tolerance Value)
Procedure:	US EPA Rapid Bioassessment Protocol III				
Taxon	Tol.[(1)]	Common Name	Count	Percent	
Nematoda	5	round worm	2	2.5%	10
Oligochaeta					
Megadrili	6	earthworm	62	76.5%	372
Nais sp.	8	naiad worm	1	1.2%	8
Gastropoda					
Hydrobiidae	8	dusky snail	2	2.5%	16
Helisoma sp.	6	orb snail	3	3.7%	18
Diptera (chironomidae)					
Smittia sp.	6	midge	4	4.9%	24
Other Diptera					
Dolichopodidae	4	long-legged fly	1	1.2%	4
Ephydridae	7	shore fly	1	1.2%	7
Erioptera sp	4	crane fly	1	1.2%	4
Molophilus sp.	4	crane fly	4	4.9%	16
Total Specimens			81	100.0%	
Percent of sample processed			71%		
Sample total (estimate)			113		
Total Taxa			10		
Shannon Diversity (base e)			1.02		
Hilsenhoff Biotic Index			5.9	Metric calculated by AECOM	

(1) Source: NYS DEC, 2019.

ATTACHMENT I TABLE 5
BENTHIC INVERTEBRATE COUNTS SED-324
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Benthic Macroinvertebrates collected by Mabbett & Associates from a tributary to to Narragansett Bay near North Kingstown, Rhode Island for a CERCLA-compliant Risk Assessment

Location:	**SED - 324 - C120 - 0 - 05**				
Sample Date:	May 28, 2020				Weighted Tolerance Value (Individual Count x Tolerance Value)
Procedure:	US EPA Rapid Bioassessment Protocol III				
Taxon	Tol.[1]	Common Name	Count	Percent	
Nematoda	5	round worm	2	4.8%	10
Oligochaeta					
Megadrili	6	earthworm	19	45.2%	114
Gastropoda					
Helisoma sp.	6	orb snail	6	14.3%	36
Hydrobiinae	8	dusky snail	1	2.4%	8
Diptera (chironomidae)					
Limnophyes sp.	8	midge	5	11.9%	40
Smittia sp.	6	midge	5	11.9%	30
Other Diptera					
Cecidomyiidae	5	gall gnat	1	2.4%	5
Dolichopodidae	4	long-legged fly	1	2.4%	4
Ephydridae	7	shore fly	2	4.8%	14
Total Specimens[2]			42	100.0%	
Percent of sample processed			100%		
Sample total (estimate)			42		
Total Taxa			9		
Shannon Diversity (base e)			-	Metric calculated by Normandeau as 1.70, but not presented for use due to low number of specimens.	
Hilsenhoff Biotic Index			6.2	Metric calculated by AECOM	

(1) Source: NYS DEC, 2019.
(2) Sample matrix processed in entirety.

ATTACHMENT I TABLE 5
BENTHIC INVERTEBRATE COUNTS SED-325
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Benthic Macroinvertebrates collected by Mabbett & Associates from a tributary to to Narragansett Bay near North Kingstown, Rhode Island for a CERCLA-compliant Risk Assessment

Location:	**SED - 325 - C120 - 0 - 05**				
Sample Date:	May 28, 2020				Weighted Tolerance Value (Individual Count x Tolerance Value)
Procedure:	US EPA Rapid Bioassessment Protocol III				
Taxon	Tol.[1]	Common Name	Count	Percent	
Oligochaeta					
Enchytraeidae	10	earthworm	6	60.0%	60
Megadrili	6	earthworm	2	20.0%	12
Diptera (chironomidae)					
Smittia sp.	6	midge	1	10.0%	6
Other Diptera					
Dolichopodidae	4	long-legged fly	1	10.0%	4
Total Specimens[2]			10	100.0%	
Percent of sample processed			100%		
Sample total (estimate)			10		
Total Taxa			4		
Shannon Diversity (base e)			-	Metric calculated by Normandeau as 1.09, but not presented for use due to low number of specimens.	
Hilsenhoff Biotic Index			8.2	Metric calculated by AECOM	

(1) Source: NYS DEC, 2019.
(2) Sample matrix processed in entirety.

ATTACHMENT I TABLE 6
BENTHIC INVERTEBRATE COUNTS SED-331
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Benthic Macroinvertebrates collected by Mabbett & Associates from a tributary to to Narragansett Bay near North Kingstown, Rhode Island for a CERCLA-compliant Risk Assessment

Location:	**SED - 331 - C120 - 0 - 05**				
Sample Date:	May 28, 2020				Weighted Tolerance Value (Individual Count x Tolerance Value)
Procedure:	US EPA Rapid Bioassessment Protocol III				
Taxon	Tol.[(1)]	Common Name	Count	Percent	
Oligochaeta					
Aulodrilus sp.	7	tube worm	3	3.2%	21
Ilyodrilus templetoni	10	tube worm	1	1.1%	10
Limnodrilus sp.	10	tube worm	46	49.5%	460
Bivalvia					
Pisidium casertanum	6	pill clam	9	9.7%	54
Isopoda					
Caecidotea sp.	8	water slater	29	31.2%	232
Diptera (chironomidae)					
Paratendipes albimanus	6	midge	4	4.3%	24
Tanypodinae	7	midge	1	1.1%	7
Total Specimens			93	100.0%	
Percent of sample processed			25%		
Sample total (estimate)			372		
Total Taxa			7		
Shannon Diversity (base e)			1.28		
Hilsenhoff Biotic Index			8.7	Metric calculated by AECOM	

(1) Source: NYS DEC, 2019.

ATTACHMENT I TABLE 7
BENTHIC INVERTEBRATE COUNTS SED-333
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Benthic Macroinvertebrates collected by Mabbett & Associates from a tributary to to Narragansett Bay near North Kingstown, Rhode Island for a CERCLA-compliant Risk Assessment

Location:	**SED - 333 - C120 - 0 - 05**				
Sample Date:	May 28, 2020				Weighted Tolerance Value (Individual Count x Tolerance Value)
Procedure:	US EPA Rapid Bioassessment Protocol III				
Taxon	Tol.[(1)]	Common Name	Count	Percent	
Oligochaeta					
Nais sp.	8	naiad worm	1	1.1%	8
Paranais littoralis	10	naid worm	8	8.4%	80
Amphipoda					
Gammarus sp.	6	side swimmer	10	10.5%	60
Ephemeroptera					
Maccaffertium sp.	3	mayfly	1	1.1%	3
Coleoptera					
Tropisternus sp.	5	scavenger beetle	1	1.1%	5
Neoporus sp.	5	diving beetle	1	1.1%	5
Diptera (chironomidae)					
Chironomus sp.	10	midge	6	6.3%	60
Micropsectra sp.	7	midge	29	30.5%	203
Orthocladiinae	5	midge	3	3.2%	15
Orthocladius complex	6	midge	11	11.6%	66
Psectrocladius sp.	8	midge	20	21.1%	160
Other Diptera					
Dasyhelea sp.	4	sand fly	1	1.1%	4
Probezzia sp.	6	sand fly	3	3.2%	18
Total Specimens			95	100.0%	
Percent of sample processed			79%		
Sample total (estimate)			121		
Total Taxa			13		
Shannon Diversity (base e)			2.02		
Hilsenhoff Biotic Index			7.2	Metric calculated by AECOM	

(1) Source: NYS DEC, 2019.

ATTACHMENT I TABLE 8
BENTHIC INVERTEBRATE COUNTS SED-335
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Benthic Macroinvertebrates collected by Mabbett & Associates from a tributary to to Narragansett Bay near North Kingstown, Rhode Island for a CERCLA-compliant Risk Assessment

Location:	**SED - 335 - C120 - 0 - 05**				
Sample Date:	May 28, 2020				Weighted Tolerance Value (Individual Count x Tolerance Value)
Procedure:	US EPA Rapid Bioassessment Protocol III				
Taxon	Tol.[(1)]	Common Name	Count	Percent	
Oligochaeta					
Enchytraeidae	10	earthworm	2	2.1%	20
Nais sp.	8	naiad worm	20	20.8%	160
Amphipoda					
Gammarus sp.	6	side swimmer	21	21.9%	126
Coleoptera					
Enochrus sp.	5	scavenger beetle	1	1.0%	5
Neoporus sp.	5	diving beetle	1	1.0%	5
Diptera (chironomidae)					
Cricotopus sp.	7	midge	1	1.0%	7
Orthocladiinae	5	midge	2	2.1%	10
Paratendipes albimanus	6	midge	1	1.0%	6
Tanytarsus sp.	6	midge	42	43.8%	252
Other Diptera					
Culicoides sp.	10	sand fly	2	2.1%	20
Probezzia sp.	6	sand fly	3	3.1%	18
Total Specimens			96	100.0%	
Percent of sample processed			14%		
Sample total (estimate)			672		
Total Taxa			11		
Shannon Diversity (base e)			1.56		
Hilsenhoff Biotic Index			6.6	Metric calculated by AECOM	

(1) Source: NYS DEC, 2019.

ATTACHMENT I TABLE 9
BENTHIC INVERTEBRATE COUNTS SED-337
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Benthic Macroinvertebrates collected by Mabbett & Associates from a tributary to to Narragansett Bay near North Kingstown, Rhode Island for a CERCLA-compliant Risk Assessment

Location:	**SED - 337 - C120 - 0 - 05**				
Sample Date:	May 28, 2020				Weighted Tolerance Value (Individual Count x Tolerance Value)
Procedure:	US EPA Rapid Bioassessment Protocol III				
Taxon	Tol.[1]	Common Name	Count	Percent	
Nematoda	5	round worm	2	2.4%	10
Oligochaeta					
Limnodrilus sp.	10	tube worm	31	36.9%	310
Paranais littoralis	10	naid worm	50	59.5%	500
Amphipoda					
Gammarus sp.	6	side swimmer	1	1.2%	6
Total Specimens[2]			84	100.0%	
Percent of sample processed			100%		
Sample total (estimate)			84		
Total Taxa			4		
Shannon Diversity (base e)			0.82		
Hilsenhoff Biotic Index			9.8	Metric calculated by AECOM	

(1) Source: NYS DEC, 2019.

(2) Sample matrix processed in entirety.

ATTACHMENT I TABLE 10
BENTHIC INVERTEBRATE COUNTS SED-339
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

Benthic Macroinvertebrates collected by Mabbett & Associates from a tributary to to Narragansett Bay near North Kingstown, Rhode Island for a CERCLA-compliant Risk Assessment

Location:	**SED - 339 - C120 - 0 - 05**				
Sample Date:	May 28, 2020				Weighted Tolerance Value (Individual Count x Tolerance Value)
Procedure:	US EPA Rapid Bioassessment Protocol III				
Taxon	Tol.[(1)]	Common Name	Count	Percent	
Nematoda	5	round worm	28	29.8%	140
Oligochaeta					
Enchytraeidae	10	earthworm	20	21.3%	200
imm. tubificid w / hair chaetae	10	tube worm	5	5.3%	50
Megadrili	6	earthworm	4	4.3%	24
Nais sp.	8	naiad worm	1	1.1%	8
Paranais littoralis	10	naid worm	9	9.6%	90
Polychaeta					
Capatella capitata cplx.	6	thread worm	1	1.1%	6
Leitoscoloplus sp. (tent.)	6	orbiniid worm	2	2.1%	12
Nereidae	6	clam worm	1	1.1%	6
Polydora cornuta	6	mud worm	14	14.9%	84
Gastropoda					
Hydrobiidae	8	dusky snail	3	3.2%	24
Amphipoda					
Gammarus sp.	6	side swimmer	1	1.1%	6
Decapoda					
Palaemonetes sp.	6	prawn	2	2.1%	12
Diptera (chironomidae)					
Orthocladius complex	6	midge	1	1.1%	6
Other Diptera					
Culicoides sp.	10	sand fly	2	2.1%	20
Total Specimens			94	100.0%	
Percent of sample processed			54%		
Sample total (estimate)			175		
Total Taxa			15		
Shannon Diversity (base e)			2.09		
Hilsenhoff Biotic Index			7.3	Metric calculated by AECOM	

(1) Source: NYS DEC, 2019.

Attachment J

Supporting Documentation for Tidal Stream Biological Evaluation

Attachment J-1

Spearman Rank Order Correlation Tests

1.0 Introduction

The following sections present the statistical correlation tests conducted to support the Ecological Risk Assessment (ERA) for Former Blue Beach Disposal Area Formerly Used Defense Site (FUDS) in North Kingstown, Rhode Island.

Samples for sediment toxicity testing and macroinvertebrate community surveys were co-located with each other and with sediment chemistry samples. A statistical correlation test (Spearman's Rho) was conducted on the co-located samples to evaluate if sediment chemistry or physical data could be the cause of observed toxicity or degraded community.

As described in Section 4.6.2.3 of the ERA, 28-day sediment toxicity tests were conducted on 5 upstream reference samples and 5 downstream Site samples using the amphipod (*Leptocheirus. plumulosus*). All samples locations were also submitted for macroinvertebrate community survey metrics.

Chemicals of potential concern (COPCs) identified in the ERA as potential causes of sediment toxicity (polychlorinated biphenyls [PCBs], metals, and polycyclic aromatic hydrocarbon [PAHs]) were included in the correlation tests. The probable effect concentration quotient (PEC-Q) for freshwater and effects range-median quotient (ERM-Q) for marine sediment for each sample (i.e., concentration divided by PEC) were included along with hazard quotients (HQs) and measures of bioavailability for divalent metals (sum of simultaneously extracted metals [SEM] subtracted by acid volatile sulfides [AVS] divided by fraction organic carbon [f_{oc}], expressed as $\sum$SEM-AVS/f_{oc}). In addition, physical parameters (total organic carbon [TOC] and fines).

Non-parametric Spearman rank correlations were conducted using the co-located sediment chemistry, sediment toxicity test, and macroinvertebrate community survey metrics results to evaluate potential relationships between chemistry, toxicity, and community. The following endpoints and metrics were included in the correlations:

- Toxicity Test Endpoints: 28-day survival, 28-day biomass, 28-day growth, or 28-day reproduction for the amphipod
- Macroinvertebrate Community Survey Metrics: Shannon Diversity, Hilsenhoff Biotic Index (HBI), total richness, and total density
- Physical parameters: TOC and fines
- Measures of bioavailability: $\sum$SEM-AVS/f_{oc}
- Sediment chemistry:
    - HQs for probable effect total HMW PAHs, total LMW PAHs, and total PAHs
    - PEC-Qs for total PAHs and total PCB Aroclors and mean metals PEC-Qs
    - Mean PEC-Qs calculated for metals and total PAHs and metals, total PAHs, and total PCB Aroclors
    - ERM-Qs for total PAHs and total PCB Aroclors and mean metals ERM-Qs

- Mean ERM-Qs calculated for metals and total PAHs and metals, total PAHs, and total PCB Aroclors

Correlations were conducted using the statistical software Minitab (version 18.1). Mean toxicity test results (not individual replicate results) were used for all the test endpoints. Non-detected sediment chemistry concentrations were included at the limit of detection. Correlations were significant if the p-value was less than 0.05.

2.0 Correlation Results

The results of the correlation tests are presented in **Table 1**. Supporting calculations and a summary of the input data used for the correlation tests are presented in **Tables 2, 3, 4, and 5**.

The correlation tests did not show significant relationships ($p<0.05$) for any paired chemistry, toxicity test, and macroinvertebrate community survey metrics results. In addition, physical parameters (TOC and fines) or measures of bioavailability ($\sum$SEM-AVS/f_{oc}) were not significantly correlated with toxicity test results or macroinvertebrate community survey metrics.

3.0 References

Buchman, M.F. 2008. NOAA Screening Quick Reference Tables, NOAA CR&R Report 08-1, Seattle WA, Office of Response and Restoration Division, National Oceanic and Atmospheric Administration.

Long, E. R., D. D. MacDonald, S. L. Smith, and F. D. Calder. 1995. Incidence of Adverse Biological Effects within Ranges of Chemical Concentrations in Marine and Estuarine Sediments, Environ. Manage.19: 81-97.

MacDonald, D.D., C.G. Ingersoll and T.A. Berger. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. Arch. Environ. Contam. Toxicol. 39. 20-31.

Minitab, Inc. 2017. Minitab® Statistical Software. Version Minitab 18.1.

Tables

ATTACHMENT J-1 TABLE 1
RESULTS OF SPEARMAN RANK ORDER CORRELATION TESTS
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

		Amphipod (*L. plumulosus*) [a]					Benthic Macroinvertebrate Metrics [d]			
		Survival 28 Day	Biomass 28 Day	Growth (dw) 28 Day	Reproduction [b] 28 Day	Reproduction [c] 28 Day	Shannon Diversity	HBI	Total Richness	Total Density
TOC	Correlation Coefficient	0.139	-0.103	-0.018	-0.248	-0.467	-0.176	-0.115	0.018	0.515
	p-value	0.701	0.777	0.96	0.489	0.174	0.627	0.751	0.96	0.128
	Number of Samples	10	10	10	10	10	10	10	10	10
Fines	Correlation Coefficient	0.119	0.19	-0.048	0.167	0.405	-0.19	0.143	-0.108	-0.5
	p-value	0.779	0.65	0.91	0.69	0.32	0.651	0.736	0.80	0.21
	Number of Samples	8	8	8	8	8	8	8	8	8
(∑SEM-AVS)/foc	Correlation Coefficient	-0.285	-0.261	-0.224	-0.176	-0.103	0.37	-0.455	0.476	-0.055
	p-value	0.425	0.47	0.53	0.63	0.77	0.293	0.19	0.17	0.88
	Number of Samples	10	10	10	10	10	10	10	10	10
Total HMW PAH Probable Effect HQ - Freshwater	Correlation Coefficient	-0.394	-0.261	-0.055	-0.2	-0.248	-0.37	-0.248	-0.03	0.139
	p-value	0.26	0.467	0.88	0.58	0.49	0.293	0.489	0.933	0.701
	Number of Samples	10	10	10	10	10	10	10	10	10
Total HMW PAH Probable Effect HQ - Marine	Correlation Coefficient	-0.394	-0.261	0.055	-0.2	-0.2	-0.37	-0.248	0.139	0.139
	p-value	0.26	0.467	0.88	0.58	0.58	0.293	0.489	0.701	0.701
	Number of Samples	10	10	10	10	10	10	10	10	10
Total LMW PAH Probable Effect HQ - Freshwater	Correlation Coefficient	-0.479	-0.467	-0.176	-0.321	-0.333	-0.418	-0.055	0.03	0.43
	p-value	0.162	0.17	0.627	0.365	0.347	0.229	0.881	0.933	0.214
	Number of Samples	10	10	10	10	10	10	10	10	10
Total LMW PAH Probable Effect HQ - Marine	Correlation Coefficient	-0.479	-0.467	-0.176	-0.321	-0.333	-0.418	-0.055	-0.03	0.43
	p-value	0.162	0.17	0.627	0.365	0.347	0.229	0.881	0.933	0.214
	Number of Samples	10	10	10	10	10	10	10	10	10
Total PAH PEC-Q - Freshwater	Correlation Coefficient	-0.413	-0.298	-0.073	-0.219	-0.261	-0.353	-0.225	0.006	0.182
	p-value	0.235	0.403	0.84	0.54	0.47	0.318	0.532	0.987	0.614
	Number of Samples	10	10	10	10	10	10	10	10	10
Total PAH ERM-Q - Marine	Correlation Coefficient	-0.413	-0.298	-0.073	-0.219	-0.261	-0.353	-0.225	0.006	0.182
	p-value	0.235	0.235	0.84	0.54	0.54	0.318	0.532	0.987	0.614
	Number of Samples	10	10	10	10	10	10	10	10	10
Mean PEC-Q Metals - Freshwater	Correlation Coefficient	0.212	0.115	0.152	-0.018	0.2	-0.164	-0.006	-0.189	0.345
	p-value	0.556	0.75	0.68	0.96	0.58	0.651	0.99	0.601	0.328
	Number of Samples	10	10	10	10	10	10	10	10	10
Mean ERM-Q Metals - Marine	Correlation Coefficient	0.212	0.115	0.152	-0.018	0.2	-0.164	-0.006	-0.189	0.345
	p-value	0.556	0.75	0.68	0.96	0.58	0.651	0.99	0.601	0.328
	Number of Samples	10	10	10	10	10	10	10	10	10
Mean PEC-Q Metals & Total PAHs - Freshwater	Correlation Coefficient	-0.345	-0.261	0.006	-0.212	-0.321	-0.394	-0.321	0.037	0.285
	p-value	0.328	0.47	0.99	0.56	0.37	0.26	0.365	0.920	0.425
	Number of Samples	10	10	10	10	10	10	10	10	10
Mean ERM-Q Metals & Total PAHs - Marine	Correlation Coefficient	-0.345	-0.261	0.006	-0.212	-0.321	-0.394	-0.321	0.037	0.285
	p-value	0.328	0.47	0.99	0.56	0.37	0.26	0.365	0.920	0.425
	Number of Samples	10	10	10	10	10	10	10	10	10

ATTACHMENT J-1 TABLE 1
RESULTS OF SPEARMAN RANK ORDER CORRELATION TESTS
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

		Amphipod (*L. plumulosus*) [a]					Benthic Macroinvertebrate Metrics [d]			
		Survival 28 Day	Biomass 28 Day	Growth (dw) 28 Day	Reproduction [b] 28 Day	Reproduction [c] 28 Day	Shannon Diversity	HBI	Total Richness	Total Density
Total PCB Aroclors PEC-Q - Freshwater	Correlation Coefficient	0.248	0.018	0.079	-0.224	-0.37	-0.297	0.006	-0.262	0.236
	p-value	0.489	0.96	0.83	0.53	0.29	0.405	0.987	0.464	0.511
	Number of Samples	10	10	10	10	10	10	10	10	10
Total PCB Aroclors ERM-Q - Marine	Correlation Coefficient	0.248	0.018	0.079	-0.224	-0.37	-0.297	0.006	-0.262	0.236
	p-value	0.489	0.96	0.83	0.53	0.29	0.405	0.987	0.464	0.511
	Number of Samples	10	10	10	10	10	10	10	10	10
Mean PEC-Q Metals + Total PAHs + Total PCB Aroclors - Freshwater	Correlation Coefficient	-0.345	-0.345	-0.115	-0.382	-0.515	-0.382	-0.273	-0.024	0.0455
	p-value	0.328	0.33	0.75	0.28	0.13	0.276	0.446	0.947	0.187
	Number of Samples	10	10	10	10	10	10	10	10	10
Mean ERM-Q Metals + Total PAHs + Total PCB Aroclors- Marine	Correlation Coefficient	0.115	-0.115	0.055	-0.273	-0.467	-0.406	-0.067	-0.152	0.455
	p-value	0.751	0.75	0.88	0.45	0.17	0.244	0.855	0.674	0.187
	Number of Samples	10	10	10	10	10	10	10	10	10

Notes:
AVS - Acid Volatile Sulfides.
dw - Dry weight.
ERM - Effects Range-Median.
ERM-Q - ERM-quotient.
HBI - Hilsenhoff Biotic Index.
HMW - High Molecular Weight.
HQ - Hazard Quotient
LMW - Low Molecular Weight.
PAHs - Polycyclic Aromatic Hydrocarbons.
PCBs - Polychlorinated Biphenyls.
PEC-Q - Probable Effect Concentration Quotient.
SEM - Simultaneously Extracted Metals.
TOC - Total organic carbon.
A p-value < 0.05 corresponded to a significant correlation.
[a] Refer to Attachment H for Amphipod toxicity testing results.
[b] Mean juveniles per surviving amphipod.
[c] Mean juveniles per female.
[d] Refer to Attachment I for Invertebrate Community metrics.

ATTACHMENT J-1 TABLE 2
CALCULATION OF PAH PEC-Qs AND ERM-Qs FOR BIOLOGICAL SAMPLES
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Freshwater		Marine
Location Group	Location	Analyte	Concentration	Probable Effect HQ	PEC-Q	ERM-Q
Upstream Reference	SED-321	Total HMW PAHs	23	3.5		2.4
Upstream Reference	SED-322	Total HMW PAHs	39	6.0		4.1
Upstream Reference	SED-323	Total HMW PAHs	45	6.9		4.7
Upstream Reference	SED-324	Total HMW PAHs	24	3.69		2.5
Upstream Reference	SED-325	Total HMW PAHs	2.3	0.35		0.24
Downstream Site	SED-331	Total HMW PAHs	8.4	1.3		0.88
Downstream Site	SED-333	Total HMW PAHs	0.72	0.11		0.075
Downstream Site	SED-335	Total HMW PAHs	10	1.5		1.0
Downstream Site	SED-337	Total HMW PAHs	6.5	1.0		0.68
Downstream Site	SED-339	Total HMW PAHs	0.93	0.14		0.097
Upstream Reference	SED-321	Total LMW PAHs	2.0	0.38		0.63
Upstream Reference	SED-322	Total LMW PAHs	2.8	0.53		0.89
Upstream Reference	SED-323	Total LMW PAHs	2.7	0.51		0.85
Upstream Reference	SED-324	Total LMW PAHs	1.1	0.21		0.35
Upstream Reference	SED-325	Total LMW PAHs	0.20	0.04		0.063
Downstream Site	SED-331	Total LMW PAHs	0.75	0.14		0.24
Downstream Site	SED-333	Total LMW PAHs	0.10	0.02		0.032
Downstream Site	SED-335	Total LMW PAHs	3.1	0.58		0.98
Downstream Site	SED-337	Total LMW PAHs	1.2	0.23		0.38
Downstream Site	SED-339	Total LMW PAHs	0.19	0.036		0.060
Upstream Reference	SED-321	Total PAHs	25		1.1	0.558
Upstream Reference	SED-322	Total PAHs	42		1.8	0.938
Upstream Reference	SED-323	Total PAHs	48		2.1	1.072
Upstream Reference	SED-324	Total PAHs	25		1.1	0.558
Upstream Reference	SED-325	Total PAHs	2.5		0.11	0.056
Downstream Site	SED-331	Total PAHs	9.2		0.40	0.205
Downstream Site	SED-333	Total PAHs	0.83		0.036	0.019
Downstream Site	SED-335	Total PAHs	13.0		0.57	0.290
Downstream Site	SED-337	Total PAHs	7.7		0.34	0.172
Downstream Site	SED-339	Total PAHs	1.1		0.048	0.025

Notes:
All results reported in milligrams per kilogram (mg/kg).
HMW - High Molecular Weight.
ERM - Effects Range-Median (Buchman, 2008).
ERM-Q - ERM-quotient (concentration/ERM).
LMW - Low Molecular Weight.
PAH - Polycyclic Aromatic Hydrocarbon.
PEC - Probable Effects Concentration (MacDonald, et al, 2000).
PEC-Q - PEC-quotient (concentration/PEC).
Probable Effect HQ - Probable Effect Hazard Quotient (concentration/UET). Calculated when PECs were not available.
UET - Upper Effects Threshold (Buchman, 2008).

	Sediment Benchmarks			
	Freshwater		Marine	
Total HMW PAHs	6.5	UET	9.6	ERM
Total LMW PAHs	5.3	UET	3.16	ERM
Total PAHs	22.8	PEC	44.792	ERM

ATTACHMENT J-1 TABLE 3
CALCULATION OF METALS PEC-Qs AND ERM-Qs FOR BIOLOGICAL SAMPLES
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Freshwater			Marine		
Location Group	Location	Analyte	Concentration	MacDonald PEC	PEC-Q	Mean PEC-Q Metals	ERM	ERM-Q	Mean ERM-Q Metals
Downstream Site	SED-335	Lead	584	128	4.56	0.99	218	2.7	0.65
Downstream Site	SED-335	Nickel	33.2	48.6	0.68		51.6	0.64	
Downstream Site	SED-335	Arsenic	26.4	33	0.80		70	0.38	
Downstream Site	SED-335	Cadmium	0.892	4.98	0.18		9.6	0.093	
Downstream Site	SED-335	Chromium	44.4	111	0.40		370	0.12	
Downstream Site	SED-335	Copper	75.3	149	0.51		270	0.28	
Downstream Site	SED-335	Zinc	253	459	0.55		410	0.62	
Downstream Site	SED-335	Mercury	0.289	1.06	0.27		0.71	0.41	
Downstream Site	SED-331	Lead	42	128	0.33	0.31	218	0.19	0.25
Downstream Site	SED-331	Nickel	16.1	48.6	0.33		51.6	0.31	
Downstream Site	SED-331	Arsenic	15.9	33	0.48		70	0.23	
Downstream Site	SED-331	Cadmium	0.964	4.98	0.19		9.6	0.10	
Downstream Site	SED-331	Chromium	10.4	111	0.09		370	0.028	
Downstream Site	SED-331	Copper	36.7	149	0.25		270	0.14	
Downstream Site	SED-331	Zinc	294	459	0.64		410	0.72	
Downstream Site	SED-331	Mercury	0.21 J	1.06	0.20		0.71	0.30	
Downstream Site	SED-333	Lead	116	128	0.91	0.30	218	0.53	0.20
Downstream Site	SED-333	Nickel	15.1	48.6	0.31		51.6	0.29	
Downstream Site	SED-333	Arsenic	11.1	33	0.34		70	0.16	
Downstream Site	SED-333	Cadmium	0.59	4.98	0.12		9.6	0.061	
Downstream Site	SED-333	Chromium	22.8	111	0.21		370	0.062	
Downstream Site	SED-333	Copper	21.5	149	0.14		270	0.080	
Downstream Site	SED-333	Zinc	118	459	0.26		410	0.29	
Downstream Site	SED-333	Mercury	0.0919	1.06	0.09		0.71	0.13	
Downstream Site	SED-337	Lead	111	128	0.87	0.23	218	0.51	0.15
Downstream Site	SED-337	Nickel	9.3	48.6	0.19		51.6	0.18	
Downstream Site	SED-337	Arsenic	3.6	33	0.11		70	0.051	
Downstream Site	SED-337	Cadmium	0.564	4.98	0.11		9.6	0.059	
Downstream Site	SED-337	Chromium	15	111	0.14		370	0.041	
Downstream Site	SED-337	Copper	20.2	149	0.14		270	0.075	
Downstream Site	SED-337	Zinc	92.4	459	0.20		410	0.23	
Downstream Site	SED-337	Mercury	0.066	1.06	0.06		0.71	0.093	
Downstream Site	SED-339	Lead	7.57	128	0.06	0.04	218	0.035	0.03
Downstream Site	SED-339	Nickel	2.62	48.6	0.05		51.6	0.051	
Downstream Site	SED-339	Arsenic	0.91	33	0.03		70	0.013	
Downstream Site	SED-339	Cadmium	0.072	4.98	0.01		9.6	0.0075	
Downstream Site	SED-339	Chromium	4.49	111	0.04		370	0.012	
Downstream Site	SED-339	Copper	4.35	149	0.03		270	0.016	
Downstream Site	SED-339	Zinc	23.1	459	0.05		410	0.056	
Downstream Site	SED-339	Mercury	0.011 J	1.06	0.01		0.71	0.015	
Upstream Reference	SED-323	Lead	27.9	128	0.22	0.10	218	0.13	0.07
Upstream Reference	SED-323	Nickel	7.3	48.6	0.15		51.6	0.14	
Upstream Reference	SED-323	Arsenic	2.64	33	0.08		70	0.038	
Upstream Reference	SED-323	Cadmium	0.053 J	4.98	0.01		9.6	0.0055	
Upstream Reference	SED-323	Chromium	10.8	111	0.10		370	0.029	
Upstream Reference	SED-323	Copper	13.4	149	0.09		270	0.050	
Upstream Reference	SED-323	Zinc	44.2	459	0.10		410	0.11	
Upstream Reference	SED-323	Mercury	0.041 J	1.06	0.04		0.71	0.058	
Upstream Reference	SED-324	Lead	28.4 J	128	0.22	0.10	218	0.13	0.07
Upstream Reference	SED-324	Nickel	7.06	48.6	0.15		51.6	0.14	
Upstream Reference	SED-324	Arsenic	2.78	33	0.08		70	0.040	
Upstream Reference	SED-324	Cadmium	0.104 J	4.98	0.02		9.6	0.011	
Upstream Reference	SED-324	Chromium	9.76	111	0.09		370	0.026	
Upstream Reference	SED-324	Copper	11.8	149	0.08		270	0.044	
Upstream Reference	SED-324	Zinc	60.1 J	459	0.13		410	0.15	
Upstream Reference	SED-324	Mercury	0.038 J	1.06	0.04		0.71	0.054	

ATTACHMENT J-1 TABLE 3
CALCULATION OF METALS PEC-Qs AND ERM-Qs FOR BIOLOGICAL SAMPLES
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

				Freshwater			Marine		
Location Group	Location	Analyte	Concentration	MacDonald PEC	PEC-Q	Mean PEC-Q Metals	ERM	ERM-Q	Mean ERM-Q Metals
Upstream Reference	SED-321	Lead	28.2	128	0.22	0.09	218	0.13	0.07
Upstream Reference	SED-321	Nickel	6	48.6	0.12		51.6	0.12	
Upstream Reference	SED-321	Arsenic	2.5	33	0.08		70	0.036	
Upstream Reference	SED-321	Cadmium	0.049 J	4.98	0.01		9.6	0.0051	
Upstream Reference	SED-321	Chromium	9.3	111	0.08		370	0.025	
Upstream Reference	SED-321	Copper	11.4	149	0.08		270	0.042	
Upstream Reference	SED-321	Zinc	46.8	459	0.10		410	0.11	
Upstream Reference	SED-321	Mercury	0.053	1.06	0.05		0.71	0.075	
Upstream Reference	SED-325	Lead	12.8	128	0.10	0.05	218	0.059	0.04
Upstream Reference	SED-325	Nickel	4.16	48.6	0.09		51.6	0.081	
Upstream Reference	SED-325	Arsenic	1.19	33	0.04		70	0.017	
Upstream Reference	SED-325	Cadmium	0.025 J	4.98	0.01		9.6	0.0026	
Upstream Reference	SED-325	Chromium	6.14	111	0.06		370	0.017	
Upstream Reference	SED-325	Copper	6.27	149	0.04		270	0.023	
Upstream Reference	SED-325	Zinc	39.5	459	0.09		410	0.10	
Upstream Reference	SED-325	Mercury	0.01 J	1.06	0.01		0.71	0.014	
Upstream Reference	SED-322	Lead	31.9	128	0.25	0.10	218	0.15	0.07
Upstream Reference	SED-322	Nickel	6.47	48.6	0.13		51.6	0.13	
Upstream Reference	SED-322	Arsenic	2.7	33	0.08		70	0.039	
Upstream Reference	SED-322	Cadmium	0.0622 J	4.98	0.01		9.6	0.0065	
Upstream Reference	SED-322	Chromium	10.3	111	0.09		370	0.028	
Upstream Reference	SED-322	Copper	12.1	149	0.08		270	0.045	
Upstream Reference	SED-322	Zinc	47.3	459	0.10		410	0.12	
Upstream Reference	SED-322	Mercury	0.04 J	1.06	0.04		0.71	0.056	

Notes:
All results reported in milligrams per kilogram (mg/kg).
PEC - Probable Effects Concentration (MacDonald, et al, 2000).
PEC-Q - PEC-quotient (concentration/PEC).
J - Analyte positively detected but value is an approximate concentration.

ATTACHMENT J-1 TABLE 4
CALCULATION OF TOTAL PCB PEC-Qs AND ERM-Qs FOR BIOLOGICAL SAMPLES
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

					Freshwater	Marine
Location Group	**Location**	**Analyte**	**Concentration**		**PEC-Q**	**ERM-Q**
Upstream Reference	SED-321	Total PCB Aroclors	0.035	U	0.052	0.19
Upstream Reference	SED-322	Total PCB Aroclors	0.061		0.090	0.339
Upstream Reference	SED-323	Total PCB Aroclors	0.19	U	0.281	1.056
Upstream Reference	SED-324	Total PCB Aroclors	0.038	U	0.056	0.211
Upstream Reference	SED-325	Total PCB Aroclors	0.063	U	0.093	0.350
Downstream Site	SED-331	Total PCB Aroclors	0.49	U	0.725	2.722
Downstream Site	SED-333	Total PCB Aroclors	0.16	U	0.237	0.889
Downstream Site	SED-335	Total PCB Aroclors	1.5		2.2	8.3
Downstream Site	SED-337	Total PCB Aroclors	0.27		0.40	1.50
Downstream Site	SED-339	Total PCB Aroclors	0.10		0.15	0.56

Notes:
All results reported in milligrams per kilogram (mg/kg).
ERM - Effects Range-Median (Buchman, 2008).
ERM-Q - ERM-quotient (concentration/ERM).
PEC - Probable Effects Concentration (MacDonald, et al, 2000).
PEC-Q - PEC-quotient (concentration/PEC).
U - Not detected. Detection limit used in calculations.

	Sediment Benchmarks			
	Freshwater		Marine	
Total PCBs	0.676	PEC	0.18	ERM

ATTACHMENT J-1 TABLE 5
CORRELATION INPUT DATA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

		Sediment Toxicity Test Results -					Physical Parameters		SEM, AVS	Benthic Macroinvertebrate Community Metrics			
Location	Site/Background	28d SV (p)	28d BIO (mg)	28d GR (mg)	28d Rep - mean juveniles per surviving amphipod (mg)	28d Rep - mean juveniles per female (mg)	TOC (mg/kg)	Fines (%)	(∑SEM-AVS)/foc (umol/goc)	Total Richness	Shannon Diversity (base e)	HBI	Total Density
SED-321	Upstream Reference	72.5	0.62	0.75	0.61	1.7	2.4001	36.27	28.86	18.0	2.29	7.71	439
SED-322	Upstream Reference	73.1	0.70	0.80	1.1	2.5	5	NA	9.15	10.0	0.78	9.38	343
SED-323	Upstream Reference	73.8	0.71	0.96	0.93	1.6	4.1001	41.74	22.22	10.0	1.02	5.91	113
SED-324	Upstream Reference	85.6	0.84	0.92	1.3	3.3	4.1	NA	14.61	9.0	1.70	6.21	42
SED-325	Upstream Reference	56.2	0.84	0.93	1.4	3.9	0.9401	42.41	9.01	4.0	1.09	8.20	10
SED-331	Downstream Site	92.5	0.70	0.75	0.38	0.8	44	2.03	0.21	7.0	1.28	8.69	372
SED-333	Downstream Site	95	0.94	0.97	1.9	3.6	6.8	3.26	7.14	13.0	2.02	7.23	121
SED-335	Downstream Site	60.6	0.45	0.73	0.27	0.67	19	28.38	-12.76	11.0	1.56	6.55	672
SED-337	Downstream Site	95.6	1.41	1.48	3.8	7.7	3.9001	62.06	-43.76	4.0	0.82	9.83	84
SED-339	Downstream Site	93.1	0.63	0.67	0.34	0.83	1.0001	92.96	10.04	15.0	2.09	7.32	175

Notes:
(a) Input data presented was used to calculate correlations presented in Attachment J-1 Table 1. Data is presented with ERA report and attachment tables.

ATTACHMENT J-1 TABLE 5
CORRELATION INPUT DATA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

		Probable Effects Concentration - Quotient							Effects Range-Median - Quotient	
Location	Site/Background	FW Total PCB Aroclors PEC-Q	FW Total PAH PEC-Q	FW Mean PEC-Q Metals	Marine Mean PEC-Q Metals	FW Mean PEC-Q Metals & Total PAHs	Marine Mean PEC-Q Metals & Total PAHs	FW Mean PEC-Q	Marine Total PCB Aroclors ERM-Q	Marine Total PAH ERM-Q
SED-321	Upstream Reference	0.052	1.10	0.0927	0.0678	0.59	0.31	0.41	0.19	0.56
SED-322	Upstream Reference	0.090	1.84	0.0989	0.0701	0.97	0.50	0.68	0.34	0.94
SED-323	Upstream Reference	0.28	2.11	0.0976	0.0696	1.10	0.57	0.83	1.06	1.07
SED-324	Upstream Reference	0.056	1.10	0.1008	0.0735	0.60	0.32	0.42	0.21	0.56
SED-325	Upstream Reference	0.093	0.11	0.0524	0.0386	0.08	0.05	0.09	0.35	0.06
SED-331	Downstream Site	0.72	0.40	0.3142	0.2511	0.36	0.23	0.48	2.72	0.21
SED-333	Downstream Site	0.24	0.04	0.2957	0.2004	0.17	0.11	0.19	0.89	0.02
SED-335	Downstream Site	2.2	0.57	0.9942	0.6519	0.78	0.47	1.26	8.33	0.29
SED-337	Downstream Site	0.40	0.34	0.2269	0.1542	0.28	0.16	0.32	1.50	0.17
SED-339	Downstream Site	0.15	0.05	0.0357	0.0258	0.04	0.03	0.08	0.56	0.02

Notes:
(a) Input data presented was used to calculate correlations presented in Attachment J-1 Table 1. Data is presented with ERA report and attachment tables.

ATTACHMENT J-1 TABLE 5
CORRELATION INPUT DATA
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

		Probable Effect HQs				
Location	**Site/Background**	**Marine Mean ERM PEC - Q**	**FW Total HMW PAH Probable Effect HQ -**	**FW Total LMW PAH Probable Effect HQ**	**Marine Total HMW PAH Probable Effect HQ -**	**Marine Total LMW PAH Probable Effect HQ**
SED-321	Upstream Reference	0.27	3.54	0.38	2.40	0.63
SED-322	Upstream Reference	0.45	6.00	0.53	4.06	0.89
SED-323	Upstream Reference	0.73	6.92	0.51	4.69	0.85
SED-324	Upstream Reference	0.28	3.69	0.21	2.50	0.35
SED-325	Upstream Reference	0.15	0.35	0.04	0.24	0.06
SED-331	Downstream Site	1.06	1.29	0.14	0.88	0.24
SED-333	Downstream Site	0.37	0.11	0.02	0.08	0.03
SED-335	Downstream Site	3.09	1.54	0.58	1.04	0.98
SED-337	Downstream Site	0.61	1.00	0.23	0.68	0.38
SED-339	Downstream Site	0.20	0.14	0.04	0.10	0.06

Notes:
(a) Input data presented was used to calculate correlations presented in Attachment J-1 Table 1. Data is presented with ERA report and attachment tables.

Statistical Output

Spearman Rho:TOC (mg/kg), Total Density

Correlations

Spearman rho	0.515
P-value	0.128

Spearman Rho:Fines (%),Total Density

Correlations

Spearman rho	-0.500
P-value	0.207

Spearman Rho:(I:SEM-AVS)/foc (umol/goc),Total Density

Correlations

Spearman rho	-0.055
P-value	0.881

Spearman Rho:Total HMW PAH Probable Effect H,Total Density

Correlations

Spearman rho	0.139
P-value	0.701

Spearman Rho:Total LMW PAH Probable Effect H,Total Density

Correlations

Spearman rho	0.430
P-value	0.214

Spearman Rho:Total PAH PEC-Q, Total Density

Correlations

Spearman rho	0.182
P-value	0.614

Spearman Rho:Mean PEC-Q Metals, Total Density

Correlations

Spearman rho	0.345
P-value	0.328

Spearman Rho:Total PCB Aroclors PEC-Q, Total Density

Correlations

Spearman rho	0.236
P-value	0.511

Spearman Rho:TOC (mg/kg), 28d SV (p)

Correlations

Spearman rho	0.139
P-value	0.701

Spearman Rho:TOC (mg/kg), 28dBIO(mg)

Correlations

Spearman rho	-0.103
P-value	0.777

Spearman Rho:TOC (mg/kg), Shannon Diversity (base e)

Correlations

Spearman rho	-0.176
P-value	0.627

Spearman Rho:TOC (mg/kg), Shannon Diversity (base e)

Correlations

Spearman rho	-0.176
P-value	0.627

Spearman Rho:TOC (mg/kg), HBI

Correlations

Spearman rho	-0.115
P-value	0.751

Spearman Rho:TOC (mg/kg), Total Richness

Correlations

Spearman rho	0.018
P-value	0.960

Spearman Rho:Fines (%), 28d SV (p)

Correlations

Spearman rho	0.119
P-value	0.779

Spearman Rho:Fines (%), 28d BIO (mg)

Correlations

Spearman rho	0.190
P-value	0.651

Spearman Rho:Fines (%), Shannon Diversity (base e)

Correlations

Spearman rho	-0.190
P-value	0.651

Spearman Rho:Fines (%), HBI

Correlations

Spearman rho	0.143
P-value	0.736

Spearman Rho:Fines (%),Total Richness

Correlations

Spearman rho	-0.108
P-value	0.799

Spearman Rho:(ISEM-AVS)/foc (umol/goc),28d SV (p)

Correlations

Spearman rho	-0.285
P-value	0.425

Spearman Rho:{ISEM-AVS)/foc (umol/goc),10d GR (mg)

Correlations

Spearman rho	-0.261
P-value	0.467

Spearman Rho:{ISEM-AVS)/foc (umol/goc),10d BIO (mg)

Correlations

Spearman rho	-0.176
P-value	0.627

Spearman Rho:{ISEM-AVS)/foc (umol/goc),Shannon ...rsity (base e)

Correlations

Spearman rho	0.370
P-value	0.293

Spearman Rho:{ISEM-AVS)/foc (umol/goc),HBI

Correlations

Spearman rho	-0.455
P-value	0.187

Spearman Rho:{ISEM-AVS)/foc (umol/goc),Total Richness

Correlations

Spearman rho	0.476
P-value	0.165

Spearman Rho:Total HMW PAH Probable Effect H,28d SV (p)

Correlations

Spearman rho	-0.394
P-value	0.260

Spearman Rho:Total HMW PAH Probable Effect H,28d B I O (mg)

Correlations

Spearman rho	-0.261
P-value	0.467

Spearman Rho:Total HMW PAH Probable Effect H,-iversity (base e)

Correlations

Spearman rho	-0.370
P-value	0.293

Spearman Rho:Total HMW PAH Probable Effect H,HBI

Correlations

Spearman rho	-0.248
P-value	0.489

Spearman Rho:Total HMW PAH Probable Effect H,Total Richness

Correlations

Spearman rho	-0.030
P-value	0.933

Spearman Rho:Total LMW PAH Probable Effect H,28d SV (p)

Correlations

Spearman rho	-0.479
P-value	0.162

Spearman Rho:Total LMW PAH Probable Effect H,28d B I O (mg)

Correlations

Spearman rho	-0.467
P-value	0.174

Spearman Rho:Total LMW PAH Probable Effect H,...Diversity (base e)

Correlations

Spearman rho	-0.418
P-value	0.229

Spearman Rho:Total LMW PAH Probable Effect H, HBI

Correlations

Spearman rho	-0.055
P-value	0.881

Spearman Rho:Total LMW PAH Probable Effect H, Total Richness

Correlations

Spearman rho	0.030
P-value	0.933

Spearman Rho:Total PAH PEC-Q, 28d SV (p)

Correlations

Spearman rho	-0.413
P-value	0.235

Spearman Rho:Total PAH PEC-Q, 28d B I O (mg)

Correlations

Spearman rho	-0.298
P-value	0.403

Spearman Rho:Total PAH PEC-Q, Shannon Diversity (base e)

Correlations

Spearman rho	-0.353
P-value	0.318

Spearman Rho:Total PAH PEC-Q, HBI

Correlations

Spearman rho	-0.225
P-value	0.532

Spearman Rho:Total PAH PEC-Q, Total Richness

Correlations

Spearman rho	0.006
P-value	0.987

Spearman Rho:Total PCB Aroclors PEC-Q, 28d SV (p)

Correlations

Spearman rho	0.248
P-value	0.489

Spearman Rho:Total PCB Aroclors PEC-Q, 28d B I O (mg)

Correlations

Spearman rho	0.018
P-value	0.960

Spearman Rho:Total PCB Aroclors PEC-Q, Shannon Diversity (base e)

Correlations

Spearman rho	-0.297
P-value	0.405

Spearman Rho:Total PCB Aroclors PEC-Q, HBI

Correlations

Spearman rho	0.006
P-value	0.987

Spearman Rho:Total PCB Aroclors PEC-Q, Total Density

Correlations

Spearman rho	0.236
P-value	0.511

Spearman Rho:TOC (mg/kg), 28d Rep - mean juveniles per su

Spearman rho	-0.248
P-value	0.489

Spearman Rho:TOC (mg/kg), 28d Rep - mean juveniles per fe

Correlations

Spearman rho	-0.467
P-value	0.174

Spearman Rho:Fines (%), 28d Rep - mean juveniles per su

Correlations

Spearman rho	0.167
P-value	0.693

Spearman Rho:Fines (%), 28d Rep - mean juveniles per fe

Correlations

Spearman rho	0.405
P-value	0.320

Spearman Rho:(ISEM-AVS)/foc (umol/goc),28d Rep - ..eniles per su

Correlations

Spearman rho	-0.176
P-value	0.627

Spearman Rho:(ISEM-AVS)/foc (umol/goc),28d Rep - ..eniles per fe

Correlations

Spearman rho	-0.103
P-value	0.777

Spearman Rho:Total HMW PAH Probable Effect H,28d ..eniles per su

Correlations

Spearman rho	-0.200
P-value	0.580

Spearman Rho:Total HMW PAH Probable Effect H,28d ..eniles per fe

Correlations

Spearman rho	-0.248
P-value	0.489

Spearman Rho:Total LMW PAH Probable Effect H, 28d ...eniles per su

Correlations

Spearman rho	-0.321
P-value	0.365

Spearman Rho:Total LMW PAH Probable Effect H, 28d ...eniles per fe

Correlations

Spearman rho	-0.333
P-value	0.347

Spearman Rho:Total PAH PEC-Q, 28d Rep - mean juveniles per su

Correlations

Spearman rho	-0.219
P-value	0.544

Spearman Rho:Total PAH PEC-Q, 28d Rep - mean juveniles per fe

Correlations

Spearman rho	-0.261
P-value	0.466

Spearman Rho:Total PCB Aroclors PEC-Q, 28d Rep - _juveniles per su

Correlations

Spearman rho	-0.224
P-value	0.533

Spearman Rho:Total PCB Aroclors PEC-Q, 28d Rep - _juveniles per fe

Correlations

Spearman rho	-0.370
P-value	0.293

Spearman Rho:Total PCB Aroclors PEC-Q, Total Richness

Correlations

Spearman rho	-0.262
P-value	0.464

Spearman Rho:FW Mean PEC-Q Metals, 28d SV (p)

Correlations

Spearman rho	0.212
P-value	0.556

Spearman Rho:FW Mean PEC-Q Metals, 28d B I O (mg)

Correlations

Spearman rho	0.115
P-value	0.751

Spearman Rho:FW Mean PEC-Q Metals, 28d Rep - mean ...iles per su

Correlations

Spearman rho	-0.018
P-value	0.960

Spearman Rho:FW Mean PEC-Q Metals, 28d Rep - mean ...iles per fe

Correlations

Spearman rho	-0.200
P-value	0.580

Spearman Rho:FW Mean PEC-Q Metals, Shannon Diversity (base e)

Correlations

Spearman rho	-0.164
P-value	0.651

Spearman Rho:FW Mean PEC-Q Metals, HBI

Correlations

Spearman rho	-0.006
P-value	0.987

Spearman Rho:FW Mean PEC-Q Metals, Total Richness

Correlations

Spearman rho	-0.189
P-value	0.601

Spearman Rho:FW Mean PEC-Q Metals, Total Density

Correlations

Spearman rho	0.345
P-value	0.328

Spearman Rho:FW Mean PEC-Q Metals & Total PA, 28d SV (p)

Correlations

Spearman rho	-0.345
P-value	0.328

Spearman Rho:FW Mean PEC-Q Metals & Total PA, 28d B I O (mg)

Correlations

Spearman rho	-0.261
P-value	0.467

Spearman Rho:FW Mean PEC-Q Metals & Total PA, 28d ••• niles per su

Correlations

Spearman rho	-0.212
P-value	0.556

Spearman Rho:FW Mean PEC-Q Metals & Total PA, 28d _niles per fe

Correlations

Spearman rho	-0.321
P-value	0.365

Spearman Rho:FW Mean PEC-Q Metals & Total PA, _iversity (base e)

Correlations

Spearman rho	-0.394
P-value	0.260

Spearman Rho:FW Mean PEC-Q Metals & Total PA, HBI

Correlations

Spearman rho	-0.321
P-value	0.365

Spearman Rho:FW Mean PEC-Q Metals & Total PA, Total Richness

Correlations

Spearman rho	0.037
P-value	0.920

Spearman Rho:FW Mean PEC-Q Metals & Total PA, Total Density

Correlations

Spearman rho	0.285
P-value	0.425

Spearman Rho:Marine Total HMW PAH Probable E,28d SV (p)

Correlations

Spearman rho	-0.394
P-value	0.260

Spearman Rho:Marine Total HMW PAH Probable E,28d B I O (mg)

Correlations

Spearman rho	-0.261
P-value	0.467

Spearman Rho:Marine Total HMW PAH Probable E,28d ••• niles per su

Correlations

Spearman rho	-0.200
P-value	0.580

Spearman Rho:Marine Total HMW PAH Probable E,28d _niles per su

Correlations

Spearman rho	-0.200
P-value	0.580

Spearman Rho:Marine Total HMW PAH Probable E,_iversity (base e)

Correlations

Spearman rho	-0.370
P-value	0.293

Spearman Rho:Marine Total HMW PAH Probable E,HBI

Correlations

Spearman rho	-0.248
P-value	0.489

Spearman Rho:Marine Total HMW PAH Probable E,Total Density

Correlations

Spearman rho	0.139
P-value	0.701

Spearman Rho:Marine Total HMW PAH Probable E,Total Density

Correlations

Spearman rho	0.139
P-value	0.701

Spearman Rho:Marine Total LMW PAH Probable E,28d SV (p)

Correlations

Spearman rho	-0.479
P-value	0.162

Spearman Rho:Marine Total LMW PAH Probable E,28d BIO (mg)

Correlations

Spearman rho	-0.467
P-value	0.174

Spearman Rho:Marine Total LMW PAH Probable E,28d _niles per su

Correlations

Spearman rho	-0.321
P-value	0.365

Spearman Rho:Marine Total LMW PAH Probable E,28d _niles per fe

Correlations

Spearman rho	-0.333
P-value	0.347

Spearman Rho:Marine Total LMW PAH Probable E,_iversity (base e)

Correlations

Spearman rho	-0.418
P-value	0.229

Spearman Rho:Marine Total LMW PAH Probable E,HBI

Correlations

Spearman rho	-0.055
P-value	0.881

Spearman Rho:Marine Total LMW PAH Probable E,Total Richness

Correlations

Spearman rho	0.030
P-value	0.933

Spearman Rho:Marine Total LMW PAH Probable E,Total Density

Correlations

Spearman rho	0.430
P-value	0.214

Spearman Rho:Marine Total PAH ERM-Q, 28d SV (p)

Correlations

Spearman rho	-0.413
P-value	0.235

Spearman Rho:Marine Total PAH ERM-Q, 28d BIO (mg)

Correlations

Spearman rho	-0.298
P-value	0.403

Spearman Rho:Marine Total PAH ERM-Q, 28d Rep - ...juveniles per su

Correlations

Spearman rho	-0.219
P-value	0.544

Spearman Rho:Marine Total PAH ERM-Q, 28d Rep - ...juveniles per fe

Correlations

Spearman rho	-0.261
P-value	0.466

Spearman Rho:Marine Total PAH ERM-Q, Shannon Diversity (base e)

Correlations

Spearman rho	-0.353
P-value	0.318

Spearman Rho:Marine Total PAH ERM-Q, HBI

Correlations

Spearman rho	-0.225
P-value	0.532

Spearman Rho:Marine Total PAH ERM-Q, Total Richness

Correlations

Spearman rho	0.006
P-value	0.987

Spearman Rho:Marine Total PAH ERM-Q, Total Density

Correlations

Spearman rho	0.182
P-value	0.614

Spearman Rho:Marine Mean PEC-Q Metals,28d SV (p)

Correlations

Spearman rho	0.212
P-value	0.556

Spearman Rho:Marine Mean PEC-Q Metals,28d BIO (mg)

Correlations

Spearman rho	0.115
P-value	0.751

Spearman Rho:Marine Mean PEC-Q Metals,28d Rep - ...eniles per su

Correlations

Spearman rho	-0.018
P-value	0.960

Spearman Rho:Marine Mean PEC-Q Metals,28d Rep - ...eniles per fe

Correlations

Spearman rho	-0.200
P-value	0.580

Spearman Rho:Marine Mean PEC-Q Metals,Shannon ...ersity (base e)

Correlations

Spearman rho	-0.164
P-value	0.651

Spearman Rho:Marine Mean PEC-Q Metals,HBI

Correlations

Spearman rho	-0.006
P-value	0.987

Spearman Rho:Marine Mean PEC-Q Metals,Total Richness

Correlations

Spearman rho	-0.189
P-value	0.601

Spearman Rho:Marine Mean PEC-Q Metals,Total Density

Correlations

Spearman rho	0.345
P-value	0.328

Spearman Rho:Marine Total PCB Aroclors ERM-Q, 28d SV (p)

Correlations

Spearman rho	0.248
P-value	0.489

Spearman Rho:Marine Total PCB Aroclors ERM-Q, 28d BIO (mg)

Correlations

Spearman rho	0.018
P-value	0.960

Spearman Rho:Marine Total PCB Aroclors ERM-Q, 28d _eniles per su

Correlations

Spearman rho	-0.224
P-value	0.533

Spearman Rho:Marine Total PCB Aroclors ERM-Q, 28d _eniles per fe

Correlations

Spearman rho	-0.370
P-value	0.293

Spearman Rho:Marine Total PCB Aroclors ERM-Q, _Diversity (base e)

Correlations

Spearman rho	-0.297
P-value	0.405

Spearman Rho:Marine Total PCB Aroclors ERM-Q, HBI

Correlations

Spearman rho	0.006
P-value	0.987

Spearman Rho:Marine Total PCB Aroclors ERM-Q, Total Richness

Correlations

Spearman rho	-0.262
P-value	0.464

Spearman Rho:Marine Total PCB Aroclors ERM-Q, Total Density

Correlations

Spearman rho	0.236
P-value	0.511

Spearman Rho:FW Mean PEC-Q, 28d SV (p)

Correlations

Spearman rho	-0.345
P-value	0.328

Spearman Rho:FW Mean PEC-Q, 28d SV (p)

Correlations

Spearman rho	-0.345
P-value	0.328

Spearman Rho:FW Mean PEC-Q, 28d BIO (mg)

Correlations

Spearman rho	-0.358
P-value	0.310

Spearman Rho:FW Mean PEC-Q, 28d Rep - mean juveniles per fe

Correlations

Spearman rho	-0.515
P-value	0.128

Spearman Rho:FW Mean PEC-Q, Shannon Diversity (base e)

Correlations

Spearman rho	-0.382
P-value	0.276

Spearman Rho:FW Mean PEC-Q, HBI

Correlations

Spearman rho	-0.273
P-value	0.446

Spearman Rho:FW Mean PEC-Q, Total Richness

Correlations

Spearman rho	-0.024
P-value	0.947

Spearman Rho:FW Mean PEC-Q, Total Density

Correlations

Spearman rho	0.455
P-value	0.187

Spearman Rho:TOC (mg/kg), 28d GR (mg)

Correlations

Spearman rho	-0.018
P-value	0.960

Spearman Rho:Fines (%), 28d GR (mg)

Correlations

Spearman rho	-0.048
P-value	0.911

Spearman Rho:(ISEM-AVS)/foc (umol/goc),28d GR (mg)

Correlations

Spearman rho	-0.224
P-value	0.533

Spearman Rho:FW Total HMW PAH Probable Effec,28d GR (mg)

Correlations

Spearman rho	-0.055
P-value	0.881

Spearman Rho:Marine Total HMW PAH Probable E,28d GR (mg)

Correlations

Spearman rho	-0.055
P-value	0.881

Spearman Rho:FW Total LMW PAH Probable Effec,28d GR (mg)

Correlations

Spearman rho	-0.176
P-value	0.627

Spearman Rho:Marine Total LMW PAH Probable E,28d GR (mg)

Correlations

Spearman rho	-0.176
P-value	0.627

Spearman Rho:FW Total PAH PEC-Q, 28d GR (mg)

Correlations

Spearman rho	-0.073
P-value	0.841

Spearman Rho:Marine Total PAH ERM-Q, 28d GR (mg)

Correlations

Spearman rho	-0.073
P-value	0.841

Spearman Rho:FW Mean PEC-Q Metals, 28d GR (mg)

Correlations

Spearman rho	0.152
P-value	0.676

Spearman Rho:Marine Mean PEC-Q Metals,28d GR (mg)

Correlations

Spearman rho	0.152
P-value	0.676

Spearman Rho:FW Mean PEC-Q Metals & Total PA, 28d GR (mg)

Correlations

Spearman rho	0.006
P-value	0.987

Spearman Rho:FW Total PCB Aroclors PEC-Q, 28d GR (mg)

Correlations

Spearman rho	0.079
P-value	0.829

Spearman Rho:Marine Total PCB Aroclors ERM-Q, 28d GR (mg)

Correlations

Spearman rho	0.079
P-value	0.829

Spearman Rho:FW Mean PEC-Q, 28d GR (mg)

Correlations

Spearman rho	-0.115
P-value	0.751

Spearman Rho:Marine Mean ERM PEC - Q, 28d GR (mg)

Correlations

Spearman rho	0.055
P-value	0.881

Spearman Rho:Marine Mean PEC-Q Metals & Tota, 28d SV (p)

Correlations

Spearman rho	-0.345
P-value	0.328

Spearman Rho:Marine Mean PEC-Q Metals & Tota, 28d BIO (mg)

Correlations

Spearman rho	-0.261
P-value	0.467

Spearman Rho:Marine Mean PEC-Q Metals & Tota, 28d ... niles per su

Correlations

Spearman rho	-0.212
P-value	0.556

Spearman Rho:Marine Mean PEC-Q Metals & Tota, 28d ... niles per fe

Correlations

Spearman rho	-0.321
P-value	0.365

Spearman Rho:Marine Mean PEC-Q Metals & Tota, 28d GR (mg)

Correlations

Spearman rho	0.006
P-value	0.987

Spearman Rho:Marine Mean PEC-Q Metals & Tota, ...iversity (base e)

Correlations

Spearman rho	-0.394
P-value	0.260

Spearman Rho:Marine Mean PEC-Q Metals & Tota, HBI

Correlations

Spearman rho	-0.321
P-value	0.365

Spearman Rho:Marine Mean PEC-Q Metals & Tota, Total Richness

Correlations

Spearman rho	0.037
P-value	0.920

Spearman Rho:Marine Mean PEC-Q Metals & Tota, Total Density

Correlations

Spearman rho	0.285
P-value	0.425

Spearman Rho:Marine Mean ERM PEC - Q 28d SV (p)

Correlations

Spearman rho	0.115
P-value	0.751

Spearman Rho:Marine Mean ERM PEC - Q 28d BIO (mg)

Correlations

Spearman rho	-0.115
P-value	0.751

Spearman Rho:Marine Mean ERM PEC - Q 28d Rep - ••• veniles per su

Correlations

Spearman rho	-0.273
P-value	0.446

Spearman Rho:Marine Mean ERM PEC - Q 28d Rep - _veniles per fe

Correlations

Spearman rho	-0.467
P-value	0.174

Spearman Rho:Marine Mean ERM PEC - Q Shannon Diversity (base e)

Correlations

Spearman rho	-0.406
P-value	0.244

Spearman Rho:Marine Mean ERM PEC - Q HBI

Correlations

Spearman rho	-0.067
P-value	0.855

Spearman Rho:Marine Mean ERM PEC - Q Total Richness

Correlations

Spearman rho	-0.152
P-value	0.674

Spearman Rho:Marine Mean ERM PEC - Q Total Density

Correlations

Spearman rho	0.455
P-value	0.187

Attachment J-2

Derivation of Reference Envelope Values and Application in Sediment Quality Triad Evaluation

1.0 Introduction

The following sections provide a summary of the derivation of reference envelope values and the use of these values in a sediment quality triad as part of the Ecological Risk Assessment (ERA) for the tidal stream located within the off-Project Red Maple Swamp/tidal stream area of the Former Blue Beach Disposal Area Formerly Used Defense Site (FUDS) in North Kingstown, Rhode Island (the Project).

Bulk sediment chemistry data, toxicity testing results, and macroinvertebrate community survey results are available from ten sampling locations within the tidal stream: five located between Circuit Drive and outfall 025 and five located between outfall 025 and Narragansett Bay. For the interpretation of these data in the ERA, the upstream portion of the stream located between Circuit Drive and outfall 025 represents the upstream background/reference area and the samples located downstream from outfall 025 are referred to as Site.

A sediment quality triad evaluation was conducted to determine if Site sample results for bulk sediment chemistry, toxicity testing, and biological community surveys are impacted for benthic invertebrate communities compared to the upstream background/reference conditions. The data collected upstream from outfall 025 are representative of local conditions in the absence of Project-related contaminants and were used as reference samples in the evaluation of the biological data. As described below, reference envelope values (REVs) were derived using data from the upstream background/reference samples and the REVs were used to identify potential Project-related impacts in Site samples using the sediment quality triad approach identified by Chapman (1992).

2.0 Reference Envelope Derivation

A reference envelope approach was used in the sediment quality triad to incorporate the spatial and temporal variation observed in the upstream background/reference samples (Hunt et al., 2001). REVs were derived for bulk sediment chemistry, toxicity testing endpoints, and community survey metrics using data from the five upstream background/reference samples to represent reference conditions for comparisons against the Site sample responses.

The Site and reference samples included in the REV derivation and sediment quality triad included those samples for which a complete and consistent dataset are available for bulk sediment chemistry, toxicity tests, and macroinvertebrate community survey. Samples for which bulk sediment chemistry data were available, but not toxicity test or macroinvertebrate community survey data, were excluded.

The lower or upper limit REVs were derived based on tolerance limits or the minimum or maximum observed values in the dataset as follows. Lower or upper tolerance limits were calculated for each line of evidence following an approach detailed by Hunt et al. (2001). Lower tolerance limits (LTLs) were used for endpoints where a lower value indicates impact (e.g., growth or reproduction in the toxicity test). Upper tolerance limits (UTLs) were used for endpoints where a higher value indicated impact (e.g., community metrics like Hilsenhoff Biotic Index [HBI] or bulk sediment related values).

If these lower or upper bounds exceeded the minimum or maximum observed values in the reference dataset, respectively, then the latter (i.e., the minimum or maximum observed reference value) was selected as the REV. Therefore, the selected REV for an endpoint falls within the range of responses observed for the reference dataset. Site test results that fall below or above the REVs indicate the Site benthic community is adversely impacted compared to the reference conditions.

The following toxicity test endpoints and benthic macroinvertebrate community survey metrics were selected for inclusion in the REV derivation:

- 28-day amphipod (*Leptocheirus plumulosus*) sediment toxicity – Mean biomass endpoint and reproduction endpoint (as mean juveniles per surviving amphipod) as sensitive measures of impacts in the toxicity tests (these endpoints showed the most frequent individual statistical differences [see Table 4-19 in the ERA]).

    - For both endpoints, a negative relationship indicates an adverse impact and a lower limit REV was selected

- Benthic Macroinvertebrate Community – Total richness, total density, and HBI as measures of diversity and pollution tolerance.

    - For total density and total richness, a negative relationship indicates an adverse impact and a lower limit REV was selected

    - For HBI, a positive relationship indicates an adverse impact and an upper limit REV was selected

Bulk sediment data for potentially Project-related chemicals were also included in the REV derivation. These chemicals include polychlorinated biphenyls (PCBs), metals, and polycyclic aromatic hydrocarbon (PAHs). These data were considered by calculating probable effect concentration quotients (PEC-Q) based on freshwater benchmarks and effects range-median quotients (ERM-Q) based on marine benchmarks. These PEC-Qs and ERM-Q were calculated in Attachment J-1 as the chemical concentration in a sample divided by the associated PEC (MacDonald et al., 2000) or ERM (Buchman, 2008). For metals, the mean PEC-Q (and ERM-Q) metals were determined as the average of the individual metals PEC-Q (and the average of the individual metals ERM-Qs). The REV considered the following two parameters for bulk sediment chemistry:

- mean of the Total PAHs, Total PCBs, and mean metals PEC-Qs

- mean of the Total PAHs, Total PCBs, and mean metals ERM-Qs

For both parameters, a positive relationship indicates an adverse impact and an upper limit REV was selected.

Table 1 presents the data evaluations and REV derivations for the toxicity test endpoints, community metrics, and bulk sediment chemistry, respectively. LTL and UTL statistics were calculated in Minitab (Version 18) and the output is presented at the end of this attachment. The data used in the REV derivations is presented in Attachment J-1 (Table 5).

Prior to the derivation of the REVs, each dataset was tested for a normal distribution using the Shapiro-Wilk test. All datasets were found to be normally distributed. Lower or upper tolerance limits were calculated as the lower or upper bound of a one-tailed tolerance interval (alpha of 0.05) with at least 90% of the population covered (Hunt et al., 2001). For all toxicity test and bulk sediment chemistry endpoints and benthic macroinvertebrate community metrics, the lower or upper tolerance limits were less than the minimum or greater than the maximum observed values, respectively. Therefore, the observed values (minimum or maximum) were selected as the REVs.

3.0 Sediment Quality Triad Evaluation

The REVs provided in **Table 1** were used to evaluate the results of co-located bulk sediment chemistry, sediment toxicity tests, and benthic invertebrate community surveys conducted on five Site samples collected within the tidal stream. The sediment quality triad approach identified by Chapman (1992) was

used to evaluate the potential for Project-related sediment impacts on the biological community within the tidal stream.

Table 2 provides a comparison of each REV against each of the individual Site endpoints for sediment contamination, sediment toxicity, and benthic alteration (i.e., benthic macroinvertebrate community impacts). Results that are outside the REV (i.e., above or below the REV as described in Section 2.0) and indicative of a potential adverse impact on the benthic community are identified with a positive ('+') symbol. A negative ('–') symbol indicates a result that is within the REV for the endpoint.

The three triad elements (i.e., sediment contamination, sediment toxicity, benthic alteration) are each scored with '+' or '-' depending upon whether an individual endpoint for that element was outside the REV. Each triad element was assigned a '+' if any of the included individual endpoints was outside the REV. A triad element was assigned a '–' if all of the individual endpoints were within the REV. The evaluation of the individual endpoints identified the following findings for each triad element:

- **Sediment contamination** – Two samples (SED-331 and SED-335) were identified as outside the REV. SED-331 was outside the REV for marine benchmarks (ERM-Qs) but not for freshwater benchmarks (PEC-Qs). SED-335 was outside the REV for both freshwater and marine benchmarks.

- **Sediment Toxicity** – Three samples (SED-331, SED-335, SED-339) were identified as outside the REV based on the results of the 28-day sediment toxicity test. SED-331 and SED-339 were outside the REV for the reproduction endpoint, but not for biomass. SED-335 was outside the REV for both biomass and reproduction.

- **Benthic alteration** – Only one sample (SED-337) was identified as outside the REV based on the benthic invertebrate community metrics. SED-337 was outside the REV for the HBI metric (higher values are indicative of more pollution tolerant communities). None of the samples were outside the REV for total richness or total density.

The findings for each element of the triad were interpreted based on a matrix provided by Chapman (1992) and are provided in **Table 2**. The matrix shown below identifies the eight possible outcomes for each sample depending upon the findings from each of the triad elements.

Outcome Number	Sediment Contamination	Toxicity	Benthic Alteration	Possible Conclusions
1	+	+	+	Strong evidence for pollution-induced degradation
2	-	-	-	Strong evidence that there is no pollution induced degradation
3	+	-	-	Chemicals are not bioavailable
4	-	+	-	Unmeasured chemicals or conditions exist with the potential to cause degradation
5	-	-	+	Alteration is not due to toxic chemicals
6	+	+	-	Toxic chemicals are stressing the system
7	-	+	+	Unmeasured toxic chemicals are causing degradation
8	+	-	+	Chemicals are not bioavailable or alteration is not due to toxic chemicals
+ Indicates response was outside the REV. - Indicates response was within the REV.				

Based on the categories identified by Chapman (1992) and comparisons to REVs, the sediment quality triad evaluation indicates that:

- None of the samples showed adverse impacts for all three elements of the triad.

- SED-333 did not show adverse impacts relative to the reference envelope values for any of the triad components which, according to Chapman (1992), provides "strong evidence that there is no pollution induced degradation."

- The remaining four samples showed an impact relative to the REVs with respect to at least one element of the triad but did not necessarily support an indication of COPC-related benthic invertebrate community impacts.

    - SED-331 and SED-335 showed impacts to the sediment chemistry and toxicity portions of the triad but not to the macroinvertebrate community.

    - SED-339 showed impacts to the toxicity portion of the triad (based on reproduction only) but not to sediment chemistry or macroinvertebrate community.

    - SED-337 showed impacts to the macroinvertebrate community portion of the triad (based on HBI only) but not to sediment chemistry or toxicity.

According to Chapman (1992), based on the impacts for two triad components including sediment chemistry, the findings for SED-331 and SED-335 suggest that "toxic chemicals are stressing the system."

Although sediment chemistry results are part of the sediment quality triad evaluation, comparisons to bulk sediment benchmarks such as the PECs or ERMs may overestimate potential risks to the benthic community. Consideration of additional information that accounts for bioavailability of contaminants (e.g., sulfides, organic carbon) is also useful in evaluating whether Project-related COPCs explain observed biological impacts.

The ERA indicated the Total PCBs were the only COPC retained in the Step 3a refined screening for tidal stream sediments (see Table 4-17 in the ERA). A sample-by-sample review of Total PCB concentrations, shows that PCBs were not detected in the SED-331 sample and the Total PCB concentration for SED-335 was 1.5 mg/kg (above the PEC and ERM, but well below the sample-specific 10% benthic injury benchmark; see Table 4-25 in the ERA). In addition, PCBs were analyzed but not detected in total or dissolved phase porewater collected from five sediment locations in and near the tidal stream in 2011 (data presented in Attachment A). These results suggest that PCBs are not likely to be the cause of impacts at these locations (or other locations in the stream).

A review of the PEC-Q and ERM-Qs calculated in Attachment J-1 show that the quotients based on metals and Total PAHs for these two samples were less than 1, suggesting that these chemicals are not likely to result in adverse impacts to the benthic community.

In addition, the evaluation of co-located simultaneously extracted metals (SEM), acid volatile sulfides (AVS), total organic carbon (TOC) data, indicated that the divalent metals were not likely to be bioavailable at any locations in the stream (see Table 4-18 in the ERA). These two samples did have among the highest TOC levels in the stream, 44% for SED-331 and 19% for SED-335, which suggests samples were collected from depositional areas.

Although the sediment quality triad indicated the potential for COPC-related impacts, primarily related to PCBs, the sample-by-sample PCB evaluation and the lack of statistical correlations between biological responses and PCBs (or other chemical stressors) suggests that observed impacts are not associated with Project-related chemicals.

3.1 Sediment Quality Triad Conclusions

The evaluation of bulk sediment chemistry, sediment toxicity testing, and benthic invertebrate community survey results found that none of the samples showed adverse impacts for all three elements of the triad. One sample (SED-333) did not show impacts relative to the REVs for any of the triad components.

The remaining samples showed impacts for one or two components. SED-339 showed an impact for the toxicity component and SED-337 showed an impact for the invertebrate community component; however, neither sample showed an impact for sediment chemistry, so impacts are not Project-related.

SED-331 and SED-335 showed impacts for two triad components including sediment chemistry, suggesting that impacts could be related to chemicals detected in the sediment. However, a review of PCB benchmark exceedances, individual PEC-Qs, ERM-Qs, and SEM, AVS, TOC results, and a lack of significant correlations with chemical stressors, suggests that observed impacts are not associated with Project-related chemicals.

4.0 References

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Tables

ATTACHMENT J-2 TABLE 1
DATA EVALUATIONS AND REFERENCE ENVELOPE DERIVATIONS
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	Upstream Background/Reference Dataset							
Endpoint/Metric	**n**	**Distribution**	**Minimum**	**Mean**	**Maximum**	**LTL/UTL**	**Statistic**	**REV**
Sediment Toxicity Testing								
28-day biomass (mg)	5	Normal	0.61	1.068	1.4	0.408	LTL	0.61
28-day mean juveniles per surviving amphipod	5	Normal	0.617	0.739	0.84	0	LTL	0.617
Macroinvertebrate Community								
Hilsenhoff Biotic Index (HBI)	5	Normal	5.91	7.482	9.38	12.4	UTL	9.38
Total density	5	Normal	10	189.4	439	0	LTL	10
Total richness	5	Normal	4	10.2	18	0	LTL	4
Sediment Chemistry								
Mean of total PAHs, total PCBs, and mean metal PEC-Qs	5	Normal	0.09	0.486	0.83	1.454	UTL	0.83
Mean of total PAHs, total PCBs, and mean metal ERM-Qs	5	Normal	0.15	0.376	0.73	1.142	UTL	0.73

Notes:
ERM-Q - Effects Range Median Quotient (marine benchmark evaluation).
LTL - Lower Tolerance Limit
PEC-Q - Probable Effect Concentration Quotient (freshwater benchmark evaluation).
REV - Reference Envelope Value
UTL - Upper Tolerance Limit

The upstream background/reference dataset includes the following samples : SED-321, SED-322, SED-232, SED-324, and SED-325.
The LTL is calculated as one-sided lower-bound tolerance interval with 95% confidence with at least 90% of population covered.
If the LTL is lower than the minimum observed value, then the minimum was selected as the REV.
The UTL is calculated as one-sided upper-bound tolerance interval with 95% confidence with at least 90% of population covered.
If the UTL is higher than the maximum observed value, then the maximum was selected as the REV.

ATTACHMENT J-2 TABLE 2
REFERENCE ENVELOPE COMPARISONS FOR SEDIMENT QUALITY TRIAD COMPONENTS
ECOLOGICAL RISK ASSESSMENT
BLUE BEACH DISPOSAL AREA
NORTH KINGSTOWN, RHODE ISLAND

	Sediment Chemistry		Sediment Toxicity		Macroinvertebrate Community						
	Mean of Total PAHs, Total PCBs, and Mean Metals PEC-Qs	Mean of Total PAHs, Total PCBs, and Mean Metals ERM-Qs	Mean Biomass (mg)	Mean Juveniles per Surviving Amphipod	Total Richness	Total Density	Hilsenhoff Biotic Index	Summary of Responses			
Reference Envelope Value	**0.83**	**0.73**	**0.61**	**0.62**	**4**	**10**	**9.4**	**Sediment Contamination**	**Toxicity**	**Benthic Alteration**	**Interpretation of Responses**
SED-331	0.48	1.1	0.70	0.38	7	372	8.7	+	+	-	Toxic chemicals are stressing the system
SED-333	0.19	0.37	0.94	1.9	13	121	7.2	-	-	-	Strong evidence that there is no pollution induced degradation
SED-335	1.3	3.1	0.45	0.27	11	672	6.6	+	+	-	Toxic chemicals are stressing the system
SED-337	0.32	0.61	1.4	3.8	4	84	9.8	-	-	+	Alteration is not due to toxic chemicals
SED-339	0.077	0.20	0.63	0.34	15	175	7.3	-	+	-	Unmeasured chemicals or conditions exist with the potential to cause degradation.

Notes:
Shading indicates a response outside the reference envelope.
A result above the reference envelope is assigned a + (impacted) for these endpoints: mean PEC-Qs, mean ERM-Qs, and HBI.
A result below the reference envelope is assigned a + (impacted) for these endpoints: biomass and juveniles per amphipod endpoints from the toxicity tests, total richness, and total density.

PEC-Q - Probable Effect Concentration Quotient (freshwater benchmark evaluation).
ERM-Q - Effects Range Median Quotient (marine benchmark evaluation).

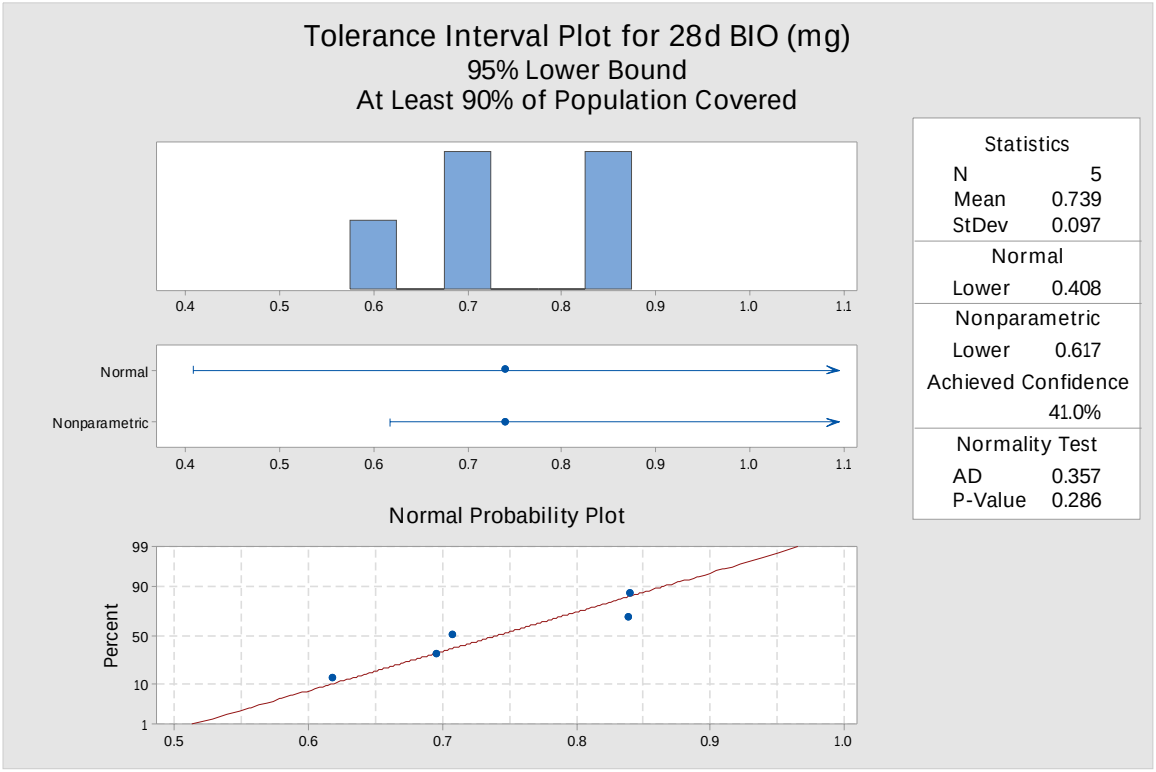
In the summary of responses for each triad component:
+ Indicates response was outside the reference envelope for at least one endpoint.
- Indicates response was within the reference envelope for all endpoints.
Interpretation of triad responses (Chapman, 1992).

Outcome Number	Sediment Contamination	Toxicity	Benthic Alteration	Possible Conclusions
1	+	+	+	Strong evidence for pollution-induced degradation
2	-	-	-	Strong evidence that there is no pollution induced degradation
3	+	-	-	Chemicals are not bioavailable
4	-	+	-	Unmeasured chemicals or conditions exist with the potential to cause degradation
5	-	-	+	Alteration is not due to toxic chemicals
6	+	+	-	Toxic chemicals are stressing the system
7	-	+	+	Unmeasured toxic chemicals are causing degradation
8	+	-	+	Chemicals are not bioavailable or alteration is not due to toxic chemicals

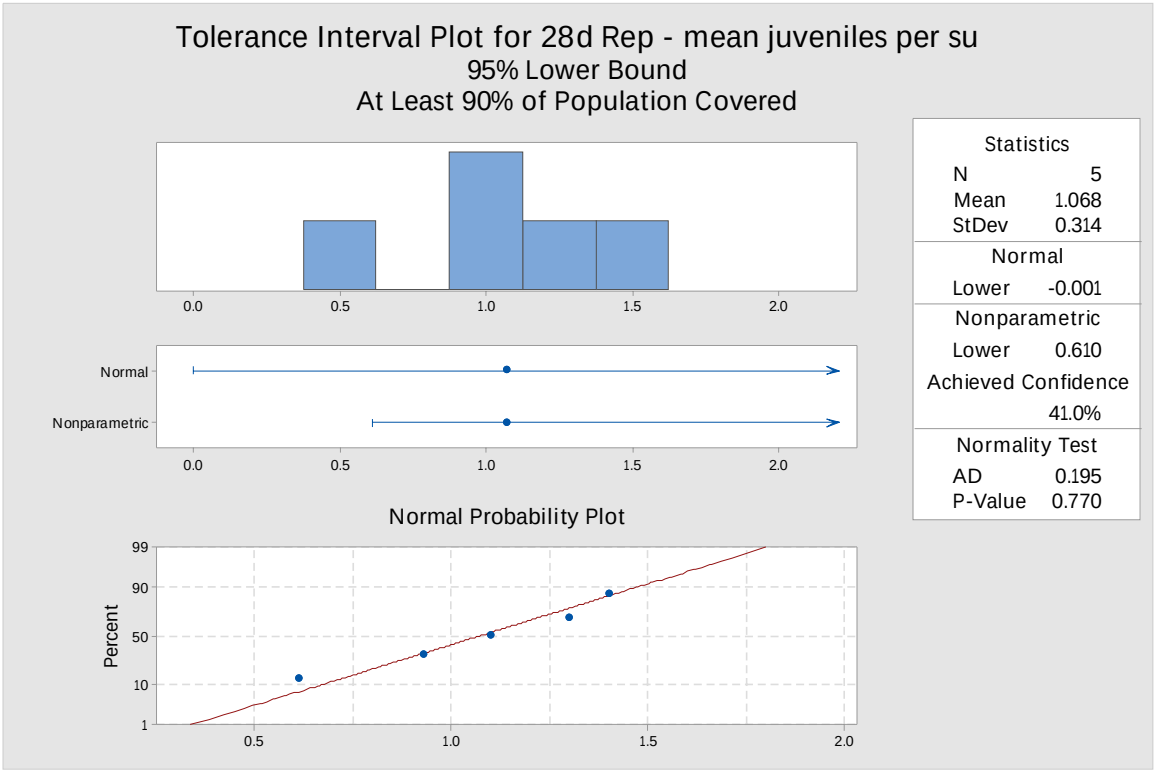
Statistical Documentaion

Attachment J-2: REV Derivation Output

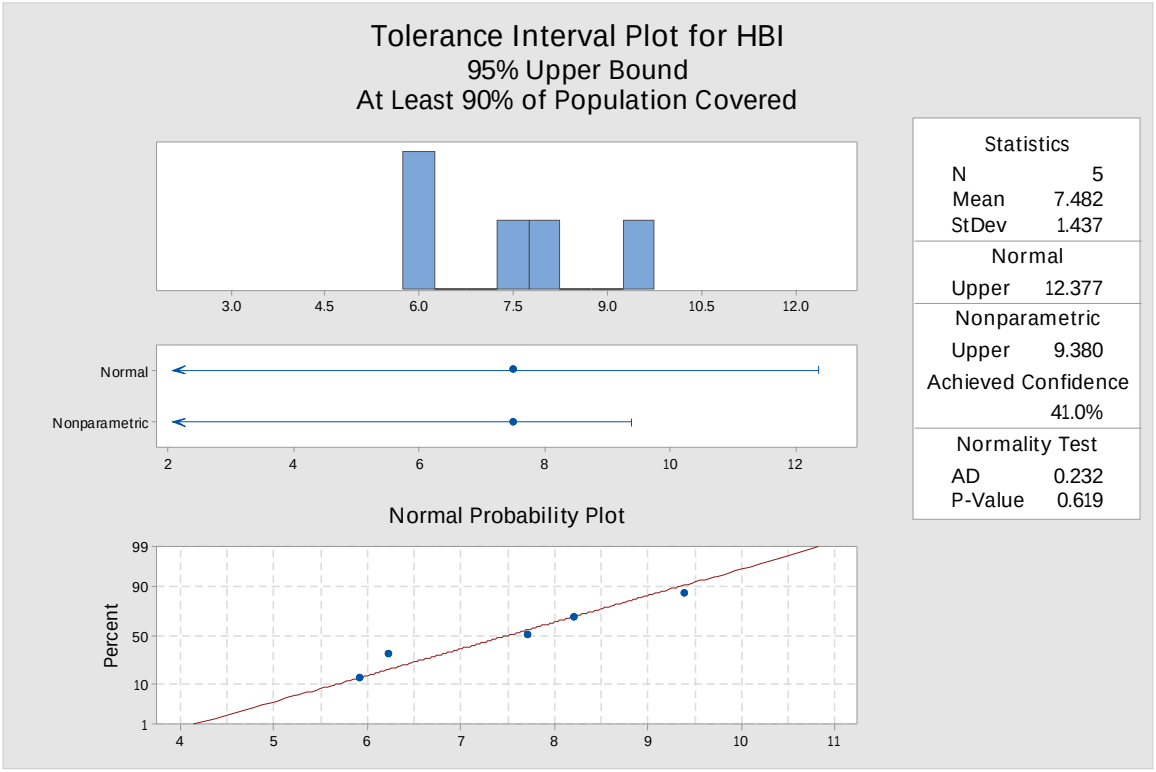
Sediment Toxicity Testing Endpoint: 28-day biomass (mg)



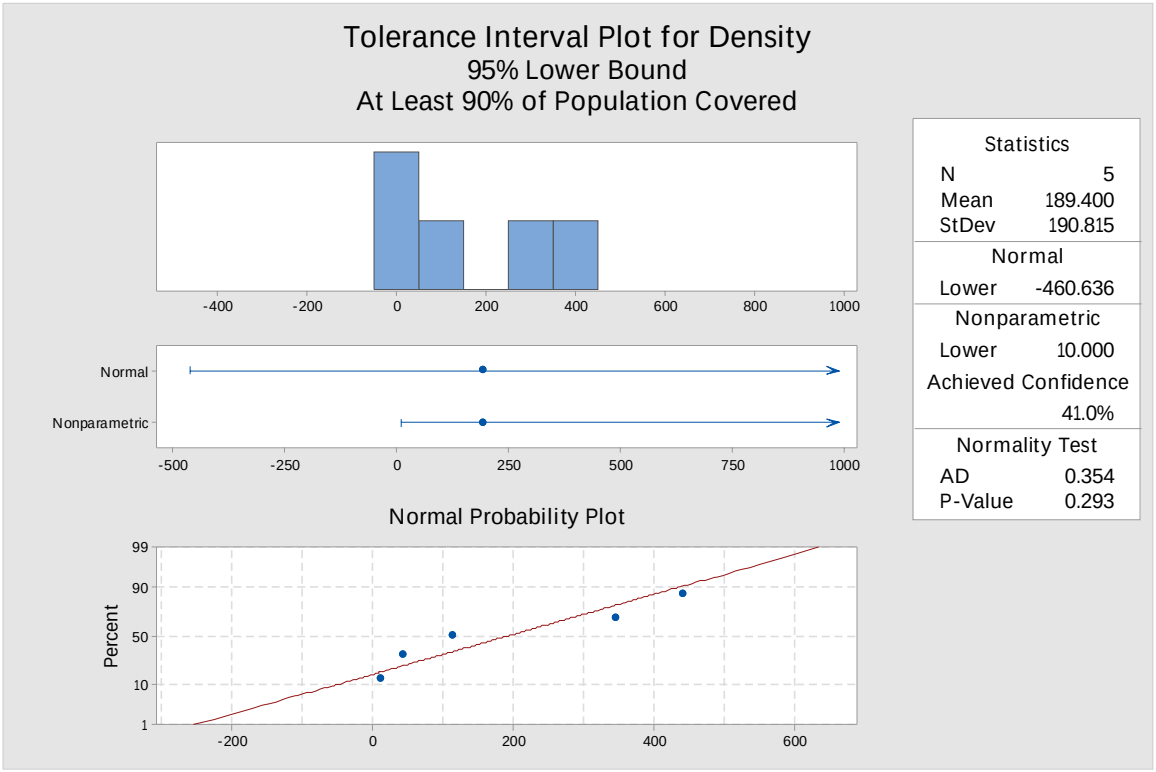
Sediment Toxicity Testing Endpoint: 28-day mean juveniles per surviving amphipod



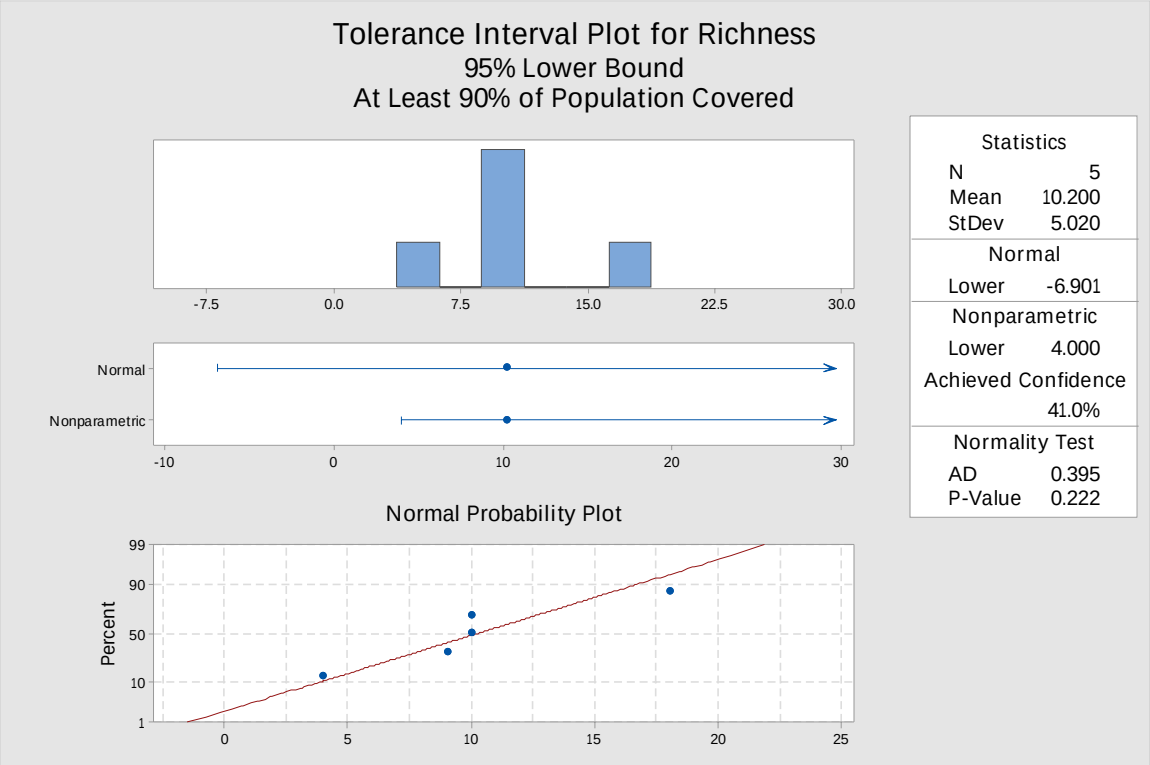
Macroinvertebrate Community Survey Metric: Hilsenhoff Biotic Index (HBI)



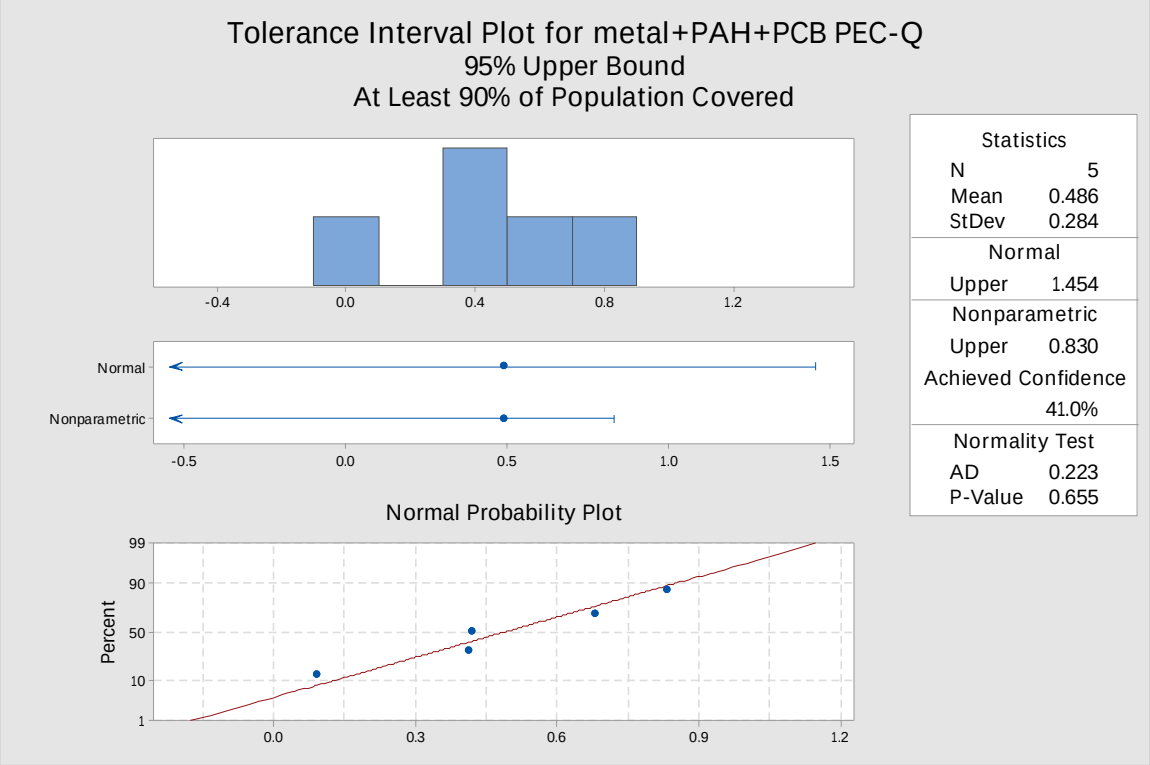
Macroinvertebrate Community Survey Metric: Total Density



Macroinvertebrate Community Survey Metric: Total Richness



Sediment Chemistry: Mean of total PAHs, total PCBs, and mean metal PEC-Qs



Sediment Chemistry: Mean of total PAHs, total PCBs, and mean metal ERM-Qs